THE RUBBER AGE

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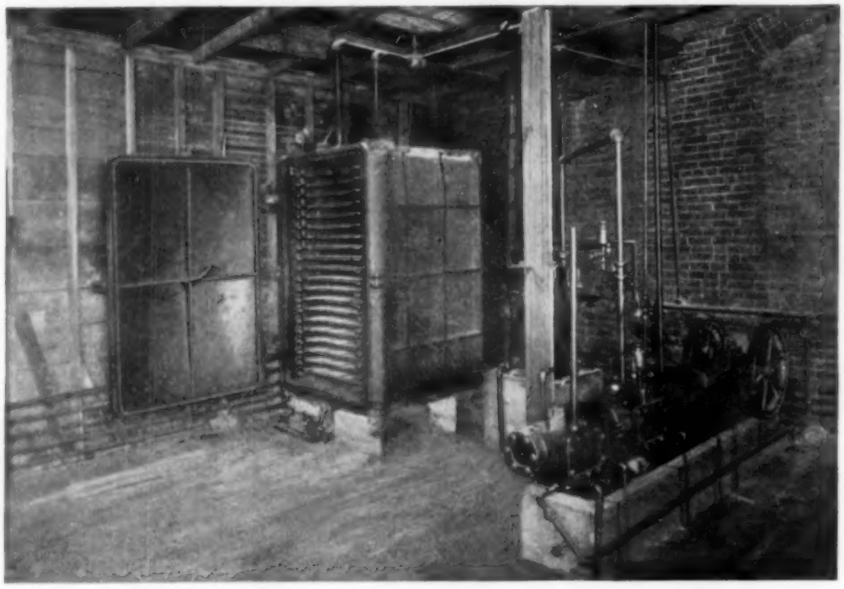

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VOL. VIII NOVEMBER 10, 1920 No. 3

A Broader Field for Safety Work

By A. A. Frank

Factory Manager, The Federal Rubber Company

The words "Safety First," "National Safety Conference," etc., have stood for many broad principles in the prevention of accidents and sickness and since their adoption and coinage have done a wonderful work. When the campaign was first launched, all attention was turned to the guarding of hazardous machines and operations and it was felt that by thus properly guarding equipment accidents would be reduced. This, however, was just the beginning.

Statistics quickly showed that the big majority of accidents were due to personal negligence and apart from machines where the mechanical guard could not be placed. What then, did this require? It required education and training in the art of self-defence against harm. This was much more difficult than the placing of mere guards.

Large industries at once undertook this difficult task of teaching and are meeting with such success that the movement is making itself felt all over the world. The more this subject is studied and analyzed, the more one begins to realize that it is so closely allied with about everything we do that we can well carry it along in all our phases of livelihood.

The fundamentals of safety in industry lie in good industrial relations. A plant that has a good morale will generally be one with a low accident record. Safety should not mean merely safety from accident or injury to the body—it should mean safety for the mind and soul. It should cover clean surroundings; fair wages; efficient work; proper home protection; recreation and outside interests.

An industrial plant that interlocks the prevention of accidents with all of these will find it to be not only humanitarian but a paying investment as well.

The organization plan of industry is generally to divide a plant into a dozen or more units to facilitate proper control and I want to show that each unit can further the safety movement. The Industrial Commission of Wisconsin has said that safety is essential to efficiency. I believe that efficiency is essential to safety. Most executives in seeking maximum safety strike at the end instead of at the beginning of the chain of factors which jointly act to reduce accidents.

Importance of Industrial Relations

In my opinion the most important of these units is industrial relations.

Where the feeling between the management and employes is that of the best, the putting over of a thorough accident prevention campaign is made considerably easier. It is difficult at best to train men in such subjects as being careful regarding health and accidents. However, if we have the proper cooperation in back of it, it becomes a pleasure. The men must have confidence in the firm and the rest is comparatively simple. Confidence is a wonderful thing and is the basis of all sound business today, and will be forever. There are many ways that industrial relations are being promulgated and developed but the fundamental in all must be confidence. Some of our largest manufacturers have organized what is commonly known as industrial democracy, shop committees and the like, which, as far as is generally known, are proving more or less successful, although the experiment on the whole is quite new. Industry is watching such concerns as the International Harvester Company, the Goodyear Tire & Rubber Company and others with great interest. Other companies have planned their relations on not so radical lines and carry out many activities in less organized form to promote this good feeling. But there must be confidence in back of it all. An employer must do whatever he does with earnest and whole-hearted endeavor. He must be sincere in all he does to create this confidence.

The rubber industry has fortunately been free from any serious labor disturbances in the last few critical years, which shows that good feeling must exist and I know that this industry ranks among the foremost in the safety movement. The two go hand in hand.

The Importance of Cleanliness

Next to good industrial relations, and fully as important, comes the matter of a clean plant, not only to further a good product and a better morale, but it is the foundation-stone upon which a safety first campaign should be built. A plant, no matter how large or how small; how intricate or how simple its process of production, must first be put in good physical condition and must be maintained so to promote safety. Aisles littered up with material, dirty dark corners and rubbish piles must be eliminated if accidents are to be reduced.

We have a department called Plant Inspection whose sole duty it is to keep the plant clean, cooperating with the foreman to prevent congestion, which helps production; also makes for safety.

Then there are the Mechanical Engineering and Plant Lay-out Departments which can do a great deal for the promotion of safety.

Insofar as guards for machines are concerned, I need not go into detail because most all industrial plants have this well in hand. It comes almost as second nature in installing machines nowadays to plan a guard for them.

It is in the proper construction of buildings, the proper lay-outs of both buildings and machinery, ventilation and good water supply, that this department can best prove its worth not only for production purposes but to directly further the safety movement.

At the present time factory buildings are designed to give the most light possible to further production. Possible safety was not given a thought when these buildings were planned but just think what they have done toward the reduction of accidents. Then the location of departments for proper movement of materials and the location of machines in departments. A proper lay-out must mean a reduction in accidents notwithstanding that it naturally helps production. Small plants generally allow foremen to lay out and plan their departments and locate their machinery. I believe it will be money well spent to have a separate department or only an

Address delivered before the Rubber Section, Ninth Annual Safety Congress, Milwaukee, Wis., October 1, 1920.

individual whose sole duty it is to plan lay-outs of the entire plant. When we consider the large investment of machinery and equipment of even a small plant, is it not worth while to spend at least the salary of a good plant lay-out engineer to place it most efficiently? Such a man has a mental picture of the operations of all departments in mind and considers a lay-out for the plant as a whole and plans production along the simplest labor saving lines. This ease of flow of materials must necessarily mean safe practices for the human element.

The Plant Lay-out Department is one of the most efficient units we have in our organization today. It functions separately from our Engineering Department, reporting directly to the factory management. Lay-outs are given to the Mechanical Engineering Department for execution and standardization. We endeavor to standardize all equipment that is used in practically all of our departments. Equipment such as motors, shafting and hangers have long been standardized. Endeavoring to standardize tables, racks, benches and trucks to satisfy the needs of various departments is, however, comparatively new. We have a standard table which was designed after taking into consideration every use that any table might be put to. Safety was the chief requisite, it being perfectly balanced and with every consideration to prevent injury. Then we have standardized such items as trucks for internal or departmental trucking. Only a few years ago when a foreman wanted a truck he picked one out of the most convenient catalog and it was ordered. In consequence, we had some seventy different species of equipment, much of which was inefficient and highly dangerous to our employes. No truck is ordered now unless the requisition passes through the hands of our internal transportation men; then the truck must be one of twenty-two standard pieces of equipment. The trucks have been so standardized as to insure the best methods of handling and in this instance also with the safety factor kept well in the foreground. We are still refining this and expect, within the near future, to have three distinct types of chassis to cover all requirements and that these chassis will accommodate any of a dozen or more types of superstructures.

I could enumerate a good many items of equipment that we have standardized in the past five years and I believe it is needless for me to tell you that this method of standardization is not only helping from the angle of duplicating equipment but it has a big bearing on the reduction of accidents. The Engineering Department, outside of its routine safety work, can be made a very important factor in reducing accidents. They, of course, must have the full support of the management in bearing in mind the safety movement when laying out their plant and designing and locating equipment.

The standardizing of trucks was brought about largely by the development of an Internal Transportation Department. This is a unit that should be included in every organization no matter how small the concern. It saves money in itself—it cuts down one of the greatest causes of accidents today. Our experience during the last three years has proven this beyond a doubt. The reduction of accidents is not due alone to standardizing of trucks, but due to the fact that we have all of our transportation in the plant under one man. A certain small group of men handle all of this work, whereas under our old system of every department having truckers, a matter of ten times the number of men handled trucks and the accidents were considerably higher.

Industrial Engineering Department

Then we have a comparatively new department in industry known as the Industrial Engineering Department which was first installed to control the methods of remuneration for production, piece-work, bonus-methods, etc. Recently, however, it has branched out into a very valuable asset by having it control production standards. If properly supervised and with the proper support, this department can be made one of the most valuable adjuncts to safety that we can have in any industry. When time-study men are sent to study an operation it should be their first duty to analyze the work and suggest better methods of handling. They may even recommend the relocation and alteration of machines in order to facilitate the ease of operation. By ease of operation I mean reduction of labor effort or fatigue, which is a large factor in the reduction of accidents. The chief object of a time-study man, of course, is to submit what some may call 100 percent time, which is the time it takes to produce an article under the best conditions in the best way, in the least possible time.

Obviously in suggesting the best way under best conditions, the man unconsciously is recommending operations in the least hazardous way, as the simplest is generally the least dangerous. If the industrial engineer is instructed to watch operations from the safety angle, just think of the value he must be when drawing up production standards. There may be some question about piece-work or bonus methods of payment being detrimental to safety but from personal experience I can assure you that our accidents to piece-workers have shown to be less than to day-workers. It is, of course, always highly recommended and desired when setting rates to have the earnings on the part of the men reasonably high so that men not quite as efficient as others can draw good wages. A fair and good rate will always tend to balance an operation and not develop into a mad race to make money.

Employment Department

The duties of this department are many, chief of which is the keeping of a perpetual inventory of the human machinery of a plant. The employment man should know the condition of all the employes. He must endeavor to keep them on the job and endeavor to keep down labor turnover. This is one of the most costly items of expense in industry today, not only because of breaking in men but it also means higher accident losses. Our accident chart shows that as labor turnover fluctuates, our accident frequency also goes up and down. Many men say that safety cuts down turnover. Here again I believe the cart to be before the horse—turnover cuts down accidents.

In the placing of men where they are best fitted to work, this department can do its best for safety in industry. This is most important, not only for the prevention of accidents but is a link in the chain that spells success or failure in building up a stable and efficient force. The Employment Department is generally given the responsibilty of being the "go-between" between the management and the individual workers and acts in the capacity of a personal service department. They are the first ones to express to the new man the policy of the management and can do so much in promoting good industrial relations that they possibly should head the list of departments that indirectly further safety.

Then there is the Production Department which controls about eighty-five per cent of the men of a plant. This is the department that must see that every individual worker carries out the rules and specifications laid down by the factory management, which covers every phase of industrial life. The foremen of the producing departments are the lieutenants of the management and upon their efficiency depends the success of the work planned and laid out by all of the other units that I have mentioned heretofore. Their chief function, of course, is to produce rubber goods according to specifications but they must manage their departments as real managers, taking into consideration every phase of activity in which their men are supposed to engage. Their influence counts for so much in any activity, whether it be safety or otherwise, that it pays to have good foremen and good department heads in the producing departments. It is the men from these departments that are generally chosen to act on safety committees and in this way tie in each individual worker of this department to the Central Safety Department and others that plan the campaigns that are to be followed and carried out.

In many instances, when selecting foremen, generally the most proficient workman is taken off the work-bench and given the opportunity to run a department. This may or may not be satisfactory, depending entirely upon the man himself. It is not so essential that the foreman be an efficient worker as it is that he be a good manager and a good handler of men. In other words, a good executive. In most industries in the country the method of making various products is all laid down by the Engineering and Specification Departments for the various producing departments to follow. Therefore, it is not the most essential qualification to be a good workman. I cannot express myself too strongly in selecting men to become foremen to see that they are properly equipped to handle men.

(Continued on page 105)

India Rubber Buffers

Buffers are essentially products for the use of engineers; but their possibilities are but poorly recognized in general engineering circles. This is not because of any inherent defects, but, nevertheless, there is another very definite and weighty reason. Moreover, it is a reason which will always act powerfully with engineers, and it simply amounts to the fact that definite information is lacking, or at least, is not readily and easily obtainable.

Nothing will so effectively prevent the extensive use of any article whatever on engineering work as ignorance of its probable behavior when subjected to certain stresses and conditions. A designer has to use his imagination based on information and experience. Of these he infinitely prefers to use reliable information, for experience was ever an expensive asset.

Pick up any engineering handbook, and you will find pages of information on steel springs; but upon the subject of rubber buffers, which could often efficiently supersede springs, they are painfully silent. This silence leads to some peculiar requests and inquiries for buffers, as witness the following actual instance:—A fairly large engineering firm sent in an inquiry for the cost of a number of rubber buffers, 4½ inch diameter by 1½ inch hole by 1½ inches deep. The specification was that they were to have no metal plates embedded, and were only to compress ⅛ inch with a suddenly and frequently applied load of 8,000 pounds. Now, while not prepared to argue that it is impossible to supply a piece of rubber cured to such a hardness that it will stand this test, yet the writer considers that it is impracticable to supply a buffer to this specification which would prove satisfactory for any lengthy period. This simply points to the fact that these potential customers had not the necessary knowledge of the possibilities of rubber buffers. They are not alone in this.

What is the result of this state of affairs? A designer requires something in the nature of shock-absorber. He can foretell quite reasonably closely the behavior of a steel spring, or of an oil dash pot, but if he inclines towards india-rubber buffers he comes up against a "snag." He has to enter into correspondence with a rubber firm, possibly holding up part of his design meanwhile, or he must chance something. Now it needs no prophetic gifts, but just a knowledge of everyday human nature, to know what he is likely to do in 90 cases out of every 100. He will plump for steel springs. Possibly he sacrifices efficiency thereby; most certainly some rubber firm has lost an order. He is not helped by the fact that agents of rubber firms frequently do not understand the possibilities and failings of buffers as well as they might do. They are not always in the happy position of the pork packing company's salesman who knew pigs from the end of their curly tails to the tip of their snouts.

Steel Springs and Buffers

It will perhaps do no harm to set down a few of the physical similarities and differences which characterize springs and buffers, and to discuss some of the points which may help a little toward knowing buffers from "cure to compression." To start at the beginning. The primary function of a spring or a buffer is to absorb shock, and its secondary function is to return some moving component to its original position. The way in which it carries out its former function is by bringing a moving object to rest relatively slowly. The more suddenly a moving body comes to rest, the greater is the force of the blow administered to the object which stops it. This may appear to be unnecessarily elementary mechanics, but it emphasizes the importance of a buffer being—what we will call for want of a better word—"juicy" or flexible. It absorbs this shock by generating heating, and the dissipation of this heat is the undoing of many buffers, especially under the conditions mentioned in the next paragraph.

Frequency of Loading

It is also essential that a buffer shall return to its original length on removal of the load, in order that it may successfully carry out its secondary function. With this in view, it is important to see that it is not overloaded. This point requires careful consideration. It may be that a certain buffer can be loaded to such an extent as to compress it to half its original length, and yet will return to its original shape immediately the load is removed. If, however, this same load is alternately applied and released for about half an hour at a frequency of about one second, the buffer generates considerable heat, gets

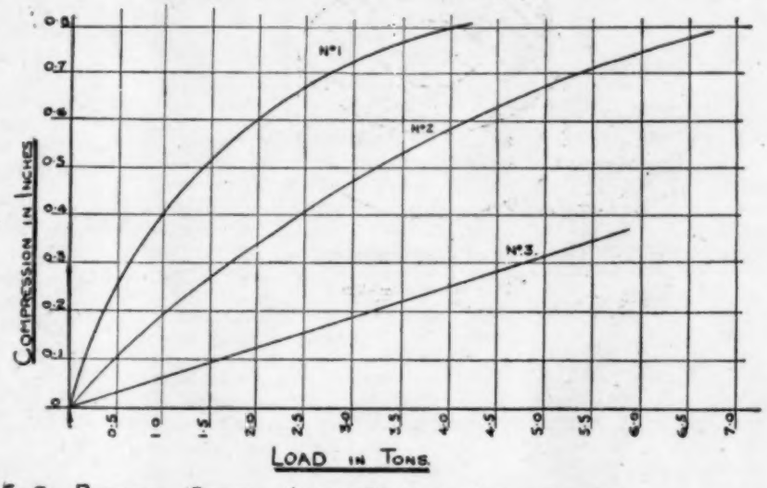

FIG I BUFFERS EFFECT OF VARYING RELATION OF AREA TO THICKNESS

FIG. 1

"tired," and will not return to its original length immediately the treatment ceases. The question of loading frequency should be carefully investigated in each individual case, as it has such an important bearing on the life of the buffer.

This "tired" feeling is not solely confined to buffers, for steel springs also suffer from it, but not to such a marked extent. In this respect—strange as it may sound—the steel of which the springs are manufactured is far more elastic than the rubber of which the buffers are composed, for a substance is only elastic as long as it returns to its original length on release after loading.

Reliability

One point where buffers score over springs is that of reliability. A steel spring may be in use for a considerable period, and appear to be working well within its limits of safety. For no apparent reason it will suddenly fracture, and a broken spring spells trouble as a general rule. Now the failure of a buffer is a much more gradual process, and therefore it can be better guarded against. Occasional inspection and judicious replacement will avoid the trouble completely, for it is quite a simple matter to detect a buffer which is giving out, while a steel spring gives no warning whatever before fracture.

Convenience in Size

When the question of springing a machine is under discussion, the depth required for the shock-absorbing device is often a matter of considerable importance, for head or foot room is generally restricted. Here again rubber buffers compare favorably with steel springs, especially when dealing with heavy loads and fairly long travels.

India Rubber Journal, London, England.

It is quite a practical proposition to supply a buffer 5 inches diameter by 2¼ inches deep, which will give a compression of one inch under a load of about 3½ tons. Now consider a steel spring to give a similar effect. This spring would have to be about 5¼ inches outside diameter, made of 1¼ inch diameter steel wire. In order to give 1 inch compression we should need about seven coils. This means that the unloaded length of the spring would be about 12 inches or 13 inches against the 2¼ inches necessary for a rubber buffer.

In fairness, it must be pointed out that the buffer will increase in outside diameter to a much greater extent than the spring; though it is a mistake to think that a steel spring

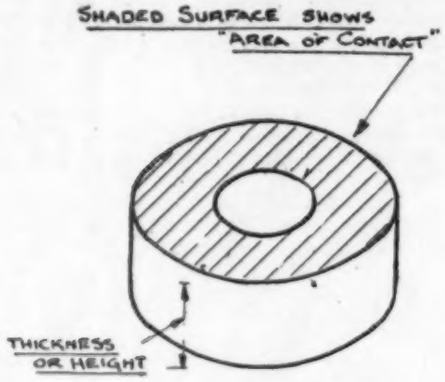

FIG II I R. BUFFERS

FIG. 2

does not increase at all the outside diameter when under load. When dealing with buffers, this increase in diameter must be watched, for if insufficient clearance is allowed in the housing, the buffer swells out to this metal casing under the influence of the loading and ceases to be a buffer. It becomes instead a solid part of the machine, and tends to induce shock rather than to absorb it.

Increase in Travel

If we desire to increase the total compression or travel of a steel spring, the method we adopt is to increase the number of coils in the spring. Exactly the same effect can be obtained by placing two or more buffers on top of one another with a steel plate between each pair. As an instance, if a load of three tons gives ¾ inches compression on a certain buffer, then we can increase that compression to the neighborhood of 1½ inches by placing two of the buffers on top of one another and subjecting them to this same load of three tons.

Knowledge of this physical fact sometimes proves very useful.

Nature of Load-Compression Curves

When steel springs are subjected to loading, the compression or travel is always proportional to the load, provided that the spring is not loaded beyond its elastic limit. Equal increments of load give equal increments of compression. If half a ton compresses it ½ inch, then one ton would compress it 1 inch, and so on. This is very convenient for purposes of calculation, and is an unvarying law.

With buffers, on the other hand, we get a varying law. Another factor arises. This factor is the relationship between the area of the buffer in contact, and the thickness of the buffer (see Fig. 2). When this area divided by this thickness gives a large figure, say in the neighborhood of 20 or 30, then conditions approach those of a steel spring. Here we have got a thin buffer in the nature of a washer.

When, however, this factor area-thickness is small, say 6 or 7, then we get a different state of affairs. Equal increments of load in this case give us decreasingly smaller increments of compression as we keep applying the loading. For instance, if one ton compressed a buffer of this type ½ inch, then a load of two tons will not compress it 1 inch, but some lesser amount, say for example, ¾ inches.

An examination of the curves of Fig. 1 will bring the above facts into prominence. They are the actual load-compression curves of three buffers made in the same quality of india-rubber, but they are for buffers of different sizes.

No. 1 is a buffer in which the contact area is eight times its thickness or height. It will be noted that at the beginning of the test, a load increment of ¼-ton compresses the buffer 0.15 in., while at the end of the test this same load increment only gives 0.02 in. compression. The object which the buffer is bringing to rest travels nearly eight times as far during the first ¼-ton as it does during the last ¼-ton. It is coming to rest "increasingly slowly."

No. 2 is a buffer in which the contact area is 17 times the thickness. The slowing up is not so apparent in this case, for the compression increments of ¼-ton loads are 0.05 in. and 0.015 inches respectively at the beginning and end of test. This variation is only about 3 to 1.

No. 3 buffer has a contact area 21 times its thickness. The curve in this case is to all intents and purposes a straight line, and exhibits load-compression features similar to those of a steel spring, namely ¼-ton load increments always produce 0.007 inches compression on the buffer.

Fig. 1 is only intended to show the nature of the curves, and cannot be used for actual loading capacity comparison. It can, however, be stated as a general rule that a tall buffer gives a much greater compression for a certain specified load than does a thin buffer of the same area. In other words a 4 inch diameter buffer 3 inches thick will compress considerably more under a 2-ton load than will a 4 inch buffer 1 inch, thick.

Load Capacity

When we approach the subject of load capacity of buffers, we come to a matter on which it is difficult to dogmatize, for we deal with rubber qualities. The buffer's usefulness or uselessness will of course absolutely depend on quality. It is, however, possible to give a general idea of the possibilities of buffers for taking loads, by assuming that a good buffer quality is used.

A good buffer is capable of taking loads which it would be very difficult to deal with by means of steel springs. If the quality is right, a 5 inch diameter buffer will stand up to a load of 5 tons, and it would not be an easy task to replace this by a single steel spring.

Generally speaking, it is pretty safe to load a good buffer up to about 750 or 800 pounds per square inch of contact area (see Fig. 2), although thin buffers will take a larger load than this fairly comfortably.

A load of these dimensions would probably compress the buffer to half its unloaded thickness.

If the load is to be frequently applied, then this allowable stress should be considerably reduced, in order to give the buffer a longer life. A stress of 400 pounds per square inch would be more suitable in this case. These load particulars should serve as a rough guide to the shock which a buffer will absorb, and should prevent the receipt of specifications which, if not ridiculous, yet lead to brain storm on the part of the manufacturers who have to comply with them.

Conclusion

These notes are intended only to cover plain buffers without inserted plates, and must only be read as such. The article is not intended as a dogmatic dissertation upon buffers in general, but merely gives some of the writer's experiences with shock-absorbing devices. The advantages of rubber buffers over springs in certain cases can be clearly seen, and it remains for the rubber trade to get together such information as will force these advantages down the engineer-designer's throat.

As a final word. It is useless to say to the engineer, "Tell me what you want the buffer to do, and I'll experiment to see if we can make one to suit you." He hasn't time, nor faith. He wants to know offhand how a buffer of a certain size may be expected to behave under a given set of circumstances. When he can know this, it may be taken pretty well for granted that rubber buffers will be used to a far greater extent than they are at present.

Methods of Preparation of Plantation Rubber

The third report of a series giving the results of mechanical and vulcanization tests, and of the chemical examination of samples of rubber prepared in connection with the scheme of rubber research arranged by the Government of Ceylon in conjunction with some of the principal planting companies in the island, and with the Imperial Institute, has now been published in the "Bulletin of the Imperial Institute." The principal object of the work is to ascertain the methods of preparing plantation rubber which lead to the production of the quality required by the rubber manufacturer.

In particular the investigations dealt with in the present report relate to the effect on the properties of plantation scrap rubber of different methods of preparation and treatment, and the cause of the general inferiority of this rubber.

Considerable difficulty was experienced in determining the vulcanizing and mechanical properties of scrap rubbers owing to the fact that test rings from the same slab of vulcanized rubber, or from different slabs of the same rubber vulcanized together, frequently gave widely varying results for tensile strength and elongation. In addition, scrap rubbers do not as a general rule appear to show the rapid drop in tensile strength and elongation when cured beyond a certain point, such as is evident in the case of latex rubber. These two features make it difficult to decide when a scrap rubber is cured to the degree adopted as the standard for purposes of comparison. In the present report all the samples have been cured to such a point that the slope of the stress-strain curve agrees as nearly as possible with the slope of the average curve given by latex rubbers at "standard cure." Determinations of the coefficient of vulcanization of certain of the samples of scrap rubber cured in this way indicated that there is in the case of scrap rubbers a definite relationship between the slope of curve and the coefficient of vulcanization such as exists in the case of latex rubbers, and that the times of cure required to produce a curve of definite slope can be taken as a basis for the comparison of the vulcanizing properties of scrap rubbers.

Another problem which presents itself in testing scrap rubbers is the difficulty of deciding from mere inspection of the crepe whether the washing has been sufficient to remove the majority of the impurities present (bark, sand, etc.). The washing losses determined in the usual way on different portions of the same sample may vary considerably. These variations may be caused partly by the difficulty of obtaining uniform samples of a scrap rubber, but are more probably due to differences in the extent to which the impurities have been removed.

The differences in washing loss were rather considerable in the case of most of the samples of scrap as collected from the trees; whereas the samples which had been washed in Ceylon showed, when re-washed at the Imperial Institute only, small variations in the different experiments.

It is evident, says the report, that prolonged washing is necessary for the removal of most of the foreign matter from scrap rubber, and that without analysis it is difficult or impossible to judge the extent to which the impurity has been removed.

Reasons for Irregularity

The reasons for the irregularity in tensile strength and elongation of different rings from the same slab of vulcanized scrap rubber and the general inferiority of this rubber have been carefully investigated. The causes which appeared most probable were:

(1) Variation in the composition of the rubber, e. g., presence of abnormal amounts of resin, protein or ash; or chemical or physical alterations of the caoutchouc itself.

(2) Presence of mechanical impurities such as bark or sand.

The amounts of resin and protein present in the scrap rubber examined are similar to those in the various grades of latex rubbers, but all the samples of scrap contain abnormal quantities of ash (mineral matter).

It seemed probable therefore that the inferiority of the scrap rubbers was not due to any variation in composition, but to the presence in the rubber of small particles of bark, sand or earthy matter which might cause minute local flaws in the vulcanized rubber, and so lead to premature rupture of the test rings. Careful examination of many broken test rings failed, however, to disclose any certain evidence of flaws or particles of bark or foreign matter at the point of rupture. Experiments have, however, been made to determine the effect of adding small quantities of powdered Hevea bark or of mineral matter to a good latex rubber, and have given interesting results.

Portions of a sample of good latex rubber were mixed with 0.25 and 0.5 per cent of powdered Hevea bark, and were then submitted to vulcanization and mechanical tests in comparison with the original rubber. The results follow:

	Time of cure	Tensile strength	Elongation	Permanent set	
		lb. per sq. inch		*Elongation*	
	Minutes		*Per-cent*	*per cent*	Remarks
1. Rubber alone	65	2,370	880	3.1	Correct cure.
2. Rubber + 0.25 per cent of bark....	68	2,250	864	3.6	Slight overcure.
3. Rubber + 0.5 per cent of bark....	68	2,200	867	3.7	Correct cure.

The above results indicate that the addition to latex rubber of small quantities of finely powdered bark has only a slight influence on the tensile strength and elongation. The rubber even with 0.5 per cent of added bark is decidedly better than any of the samples of scrap rubber examined, and it seems unlikely that as much as 0.5 per cent of bark is present in any well-washed scrap rubber.

Addition of Mineral Matter to Latex Rubber

In order to investigate the influence of the mineral matter (ash) in scrap rubber, a preliminary experiment was made in which about 1 per cent of ash (obtained by incinerating a scrap rubber) was added to a latex rubber of good quality during the process of mixing with sulphur in the usual way. This mixture showed signs of becoming soft and tacky on the mixing rolls as scrap rubbers generally do, and gave inferior results for tensile strength after curing.

Further experiments were therefore conducted in which the following additions were made to a good latex rubber: (1) a small quantity of ash from a scrap rubber; (2) the amount of sand and silica present in (1); and (3) a quantity of levigated chalk equal to the amount of ash used in (1).

The results indicated that the addition of the ash of a scrap rubber to a latex rubber of good quality reduces the tensile strength considerably, and that the sand and silica present in the ash alone produce an equally bad effect. The addition of finely divided chalk does not have any injurious effect.

It seemed probable from these experiments that the presence of particles of sand in scrap rubber has a marked influence on their physical properties after vulcanization. Experiments were therefore made to investigate further the influence on latex rubber of sand of a degree of fineness similar to that of the mineral matter in the scrap rubbers. The mineral matter (ash) occurring in these scrap rubbers varied from 0.71 to 5.89 per cent and was found to be in a fairly fine state of division, the greater part passing through a sieve of 120 meshes to the inch.

Ground sand of different degrees of fineness was added to a latex rubber of good quality, 1 per cent of sand being used in each case. Particulars of the samples and the results of the tests are given below:

	Time of cure [1]	Tensile strength	Elongation
	Minutes	*lb. per sq. in.*	*Per cent*
1. No sand (Control).....	65	2,420	883
2. 1 per cent. sand passing 50, not passing 120-mesh sieve	65	1,880	831
3. 1 per cent. sand passing 120, not passing 180-mesh sieve	65	1,960	849
4. 1 per cent. sand passing 180-mesh sieve	65	2,280	868

[1] All these samples were slightly overcured at 65 minutes, but the degree of overcure is equal in all cases and the results are therefore comparable.

(*Continued on page 105*)

India Rubber Journal, London, England.

Determination of Antimony in Rubber Goods

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Antimony sulphide is used in all types of rubber compounds as a pigment and sulphur-carrier. Where used as a sulphur-carrier the amount of sulphur required for the proper vulcanization seems to be less than when other methods are employed. The product thus obtained has less tendency to bloom.

When the ordinary methods of analysis are used high results are obtained for the percentage of rubber present because of the loss of antimony during ashing. In addition the "total sulphur should be corrected for the amount present as antimony trisulphide. For these and other reasons special methods of analysis must be used for rubber compounds containing antimony.

Up to the present time, the methods of analysis required a separate sample for the determination of the antimony. This was generally accomplished by completely decomposing the rubber sample, precipitating the antimony as the sulphide and finally determining the antimony gravimetrically as the trisulphide, or volumetrically by oxidation with iodine.

Experimental Work

At the Bureau of Standards cymene has been found to be an excellent solvent for vulcanized rubber. Cymene is not poisonous, is neutral, does not form salts with the mineral fillers or accelerators, and is readily obtainable, being a by-product of the paper industry. Sometimes it is desired to determine other ingredients than antimony. This is best accomplished by the use of a solvent which will remove the rubber from the mineral fillers at a comparatively low temperature.

In the proposed method the antimony sulphide is separated from the rubber and other mineral constituents, thus making it possible to determine antimony, rubber, and the mineral constituents on the same sample.

As a check method by which to judge the correctness of the results by the proposed method, 0.5 gram of the sample of rubber was heated with potassium sulphate and sulphuric acid until all organic matter was destroyed. The solution was diluted to 250-275 cc, 20 cc of concentrated hydrochloric acid was added to the mixture; cooled to about 10-15 deg. C and titrated with N/10 potassium permanganate.

N/10 potassium permanganate should be standardized against pure metallic antimony as follows: Weigh out 0.25 gram of pure metallic antimony, transfer to a 600-cc Erlenmeyer flask, add 12 cc of concentrated sulphuric acid and heat until the antimony has been completely dissolved. Add ½ gram of sodium sulphite and boil until the sulphur dioxide is all driven out. Test with starch iodide paper. Dilute the solution to 250-275 cc with distilled water, add 20 cc of concentrated hydrochloric acid, cool to 10-15 deg. C, and titrate until a faint pink color is obtained. From the number of cc used calculate the value of 1 cc of potassium permanganate in terms of grams of antimony.

Testing the Method

To test the method rubber compounds of known composition[3] were analyzed as follows: The rubber compound was dissolved by heating in cymene; the solution was cooled, diluted with petroleum ether, allowed to stand and filtered through a Gooch crucible. The residue in the flask and Gooch crucible was washed with petroleum ether. The flask and crucible were dried, and weighed for subsequent determination of the total amount of fillers present. The antimony sulphide in the flask and crucible was dissolved with concentrated hydrochloric acid, the solution was collected in an Erlenmeyer flask, and diluted to a definite volume. Sulphuric acid was added and the mixture boiled to expel the hydrogen sulphide. The solution was then cooled to 10-15 deg. C and titrated with the standard permanganate.

It was noticed that the solution, after expulsion of the hydrogen sulphide, remained slightly yellow. However, this color disappeared as the end of the titration was approached. This fact, as also the values given in Table I, led us to believe that some organic matter was dissolved out by the hydrochloric acid and caused high results.

TABLE I

RESULTS BY THE NEW METHOD BEFORE REMOVING ORGANIC MATTER

Sample No.	Percentage of Antimony present in sample	Check Method Antimony per cent	New Method Antimony, per cent		
1	4.47	4.60	5.05	5.05	
2	4.47	4.48	4.99	4.99	
3	4.47	4.59	4.93	5.16	5.05
4	6.52	6.43	6.94		
5	6.52	6.65	7.25	7.19	6.88
6	6.52	6.75	6.92	6.90	7.13
7	3.59	3.78	4.07	4.00	

In order to eliminate this defect, the antimony, after being dissolved from the flask and crucible, was precipitated as the sulphide, filtered, and transferred with the filter paper to a Kjeldahl flask, and the determination completed as by the check method. The data in Table II indicate that low results might be due to loss of antimony by volatilization or to its oxidation.

TABLE II

RESULTS BY THE NEW METHOD AFTER REMOVING ORGANIC MATTER

Sample No.	Percentage of Antimony present in sample	Check Method Antimony per cent	New Method Antimony, per cent	
1	4.47	4.65	4.41	4.44
2	4.47	4.46	4.28	4.31
3	4.47	4.64	4.31	4.29
4	6.52	6.22	6.18	6.07
5	6.52	6.52	6.36	6.23
6	6.52	6.61	5.98	6.11

It was then decided to use pure metallic antimony to determine this. Determinations were carried out as described in the check method, using, (a) 100 mg. of pure metallic antimony, and (b) 100 mg. of pure metallic antimony and 400 mg. of rubber. Under (a) the Kjeldahl flask and its contents were heated excessively for two to three hours, in order to magnify the oxidation or volatilization of the antimony. From the data in Table III, it appeared that low results might be due to volatilization or oxidation of the antimony. Also that the results varied according to the length of time of heating.

TABLE III

RESULTS ON METALLIC ANTIMONY BEFORE CORRECTION FOR OXIDATION OF ANTIMONY

Antimony mg. found	Antimony and rubber mg. found
82.79	98.68
79.83	98.97
80.53	97.30
89.34	98.47

The condensed vapors obtained by excessive heating of a sample as in the check method, gave no test for antimony, which indicated that no antimony was lost by volatilization. However, by repeating (a) and (b) in preceding paragraph but adding sodium sulphite, boiling off the excess of sulphur dioxide, and completing the determination in the usual way, results were obtained which clearly indicated that oxidation of the antimony took place.

1. Published by permission of the Director of the Bureau of Standards.
2. This article is part of a paper "The Analysis of Rubber Goods Containing Antimony Pigments," to be published later.
3. These samples were obtained through the courtesy of the Boston Belting Company and Federal Rubber Company.

TABLE IV

RESULTS ON METALLIC ANTIMONY AFTER CORRECTION FOR OXIDATION OF THE ANTIMONY

Antimony mg. found	Antimony and rubber mg. found
100.5	100.5
100.5	100.5
100.1	100.2
100.1	100.3

Final Method

When a qualitative analysis indicates that antimony is present extract 0.5 gram sample with acetone for eight hours to remove free sulphur, rubber resins, and mineral oils or waxes and part of any bituminous substances or vulcanized oils. If the extract indicates that mineral oils or substitutes have been used, the sample must be further extracted with chloroform until the chloroform in the extraction bucket is colorless. Completely evaporate off the solvent from the rubber sample in a vacuum desiccator. Transfer the sample to a tared, 300-cc lipped assay flask; add 25 cc of cymene, and heat on an electric hot plate at 130-140 deg. C until the rubber has completely dissolved as shown by the fillers settling out and the supernatant liquor becoming almost clear. Remove the flask, allow the solution to cool, dilute with 250 cc. of petroleum ether (B.P. up to 45 deg. C) and allow the solution to stand over night. Prepare a Gooch crucible with a tight asbestos pad, using asbestos which has been treated previously with alkali, concentrated hydrochloric acid and finally water. Carefully wipe off the crucible, dry, ignite and weigh.

For the best success it is necessary to filter slowly by means of gentle suction. The solution is now filtered, keeping as much as possible of the fillers in the flask. Wash by decantation with petroleum ether until the filtrate is colorless. At least 10 washings should be made. Carefully wipe off the sides of the flask and crucible; dry for 1 hour at 100 deg. C; cool, and weigh. These weights are to be used in the determination of the total fillers.

Add 30 cc. of concentrated hydrochloric acid to the tared assay flask and shake until all the antimony sulphide has gone into solution. Filter very slowly 5 cc. of this solution at a time through the tared Gooch crucible by means of very gentle suction, and collect the filtrate in a 400-cc. beaker. Then wash with boiling water, and by use of a policeman transfer the entire contents of the flask to the crucible; set aside the Gooch crucible for the determination of the total fillers. Dilute the filtrate in the beaker to about 250 cc. with hot distilled water, and pass in hydrogen sulphide until the antimony has been completely precipitated. The antimony may be determined by either of the following methods:

Determination of Antimony

(1) Filter off the antimony sulphide, and test to see if the precipitation was complete. Wash the precipitate with hydrogen sulphide water and transfer the precipitate to the filter paper. It is frequently difficult to entirely transfer the antimony sulphide to the filter paper in which case place 20 cc. of concentrated hydrochloric acid in the beaker and set aside temporarily. Transfer the antimony sulphide and the filter paper to a Kjeldahl flask; add 12-15 cc. of concentrated sulphuric acid; add 5 grams of potassium sulphate; place a funnel in the neck of the flask and heat until the solution becomes colorless. Wash the funnel and dilute the solution to about 100 cc. with water, add 1-2 gram of sodium sulphide, transfer the hydrochloric acid in the beaker in which antimony sulphide was precipitated to the Kjeldahl flask and boil until the sulphur dioxide is all driven out. This may be determined by the use of strach iodate paper. Dilute to 250-275 cc. with distilled water ,cool to 10-15 deg. C and titrate with permanganate solution until a faint pink color is obtained.

(2) With the aid of a Witt place prepare a suitable asbestos pad in the bottom of a carbon funnel, filter and wash as described under (1). Transfer the plate, pad, and precipitate to a 600-cc Erlenmeyer flask by means of a glass rod pushed up through the stem of the funnel. Remove any precipitate adhering to the original beaker or to the funnel by washing with the hydrochloric acid. Wash the beaker and funnel with hot distilled water, dilute the solution to 250-275 cc with distilled water, add 12 cc of concentrated sulphuric acid, boil the solution until no test for hydrogen sulphide is obtained with lead acetate paper, cool to 10-15° C, and titrate against the standard permanganate as above.

The results given in Table V. indicate that either variation of the final method may be used.

TABLE V

RESULTS ON ANTIMONY PIGMENT AFTER CORRECTION FOR OXIDATION OF ANTIMONY

Amount taken	Mg. of Antimony Found					
	Modification 1			Modification 2		
100 mg. of antimony pigment containing 27.1 mg. of antimony..	27.1	26.9		27.3	27.1	27.3
100 mg. of antimony pigment used above + 400 mg. of rubber..	27.1	26.9	27.0			

Summary

1. Cymene has been found to be an excellent solvent for vulcanized rubber at a comparatively low temperature, is not poisonous, is neutral and does not form salts with mineral fillers or accelerators.
2. This method gives accurate results for Antimony.
3. Constituents other than antimony may be determined.
4. Oxidation of antimony during digestion is corrected for by the addition of sodium sulphite.

Methods of Preparation of Plantation Rubber

(*Continued from page 103*)

To sum up. All the scrap rubbers examined have given low results for tensile strength and elongation. It seems almost certain from the experiments described in the report that this inferiority is due to the presence of foreign matter which cannot be entirely removed by washing; and that of these impurities it is the mineral matter, particularly the particles of sand, which is the chief cause of the defect.

In view of these results it may be suggested that, if possible, methods of collecting scrap should be adopted which will reduce to a minimum the amounts of bark and sand present, particularly the latter, and that the rubber should be thoroughly washed before manufacture to remove the impurities to some extent.

Further matters investigated and dealt with in the course of the report were: The effect of smoking on the mechanical properties of the vulcanized rubber, the effect of evaporating latex in a vacuum drier, the effect of different methods of drying, and the effect of preparing rubber in various ways.

Most of these samples were prepared in repetition of previous experiments, and the results generally confirm those already recorded. It is evident (1) that smoking usually lengthens the time of cure of sheet rubber without markedly affecting the mechanical properties of the rubber; (2) that different methods of drying have little effect on the vulcanizing and mechanical properties; (3) that rubber allowed to remain in a moist condition is quick curing; and (4) that thin crepe rubber cures slowly, whereas blanket crepe approximates in this respect to ordinary sheet.

A Broader Field for Safety Work

(*Continued from page 100*)

Health and Safety Department

I am bringing this department in last not because it necessarily belongs there but because I want to show that all of the Departments of an organization play such an important part, that if they were not cooperating, the Safety Department would have great difficulty in making progress. The most difficult work this department has in launching a safety campaign is the training of men to be careful and to cooperate in the safety movement, but as I mentioned in the beginning of my talk, if the proper foundation of good feeling exists and the plant is in good physical condition, the equipment is right and the men are happy, it is a simple matter to make a showing on the part of the Safety Department.

A Quarter Century of Cotton

An interesting graphic and statistical record of the production has recently been copyrighted, printed and distributed by A. Norden & Co., New York. This chart, which is issued annually, is compiled from the records of the various cotton exchanges, from Shepperson's Cotton Facts," "The Commercial and Financial Chronicle" and the United States Census Bureau.

In addition to the chart which shows graphically the record for Middling Uplands in New York (spot cotton)—quarterly highs and lows there is an interesting chart showing production figures for the quarter century beginning 1894-95.

Acreage by States

	1915-6	1916-7	1917-8	1918-9	1919-0
North Carolina	1,300	1,490	1,562	1,609	1,525
South Carolina	2,555	2,950	2,880	2,995	2,900
Georgia	4,925	5,450	5,274	5,432	5,404
Alabama	3,400	3,469	2,017	2,622	2,900
Mississippi	2,760	3,310	2,814	3,264	3,000
Louisiana	1,010	1,260	1,465	1,553	1,700
Texas	10,725	11,525	11,676	11,910	11,025
Oklahoma	2,000	2,614	2,900	3,161	2,512
Arkansas	2,260	2,630	2,810	2,922	2,865
Tennessee	780	895	908	926	798
Sundries	392	459	619	679	504
Total	32,107	36,042	34,925	37,073	35,133

Production by States-Excluding Linters

	1915-6	1916-7	1917-8	1918-9	1919-0
North Carolina	737	694	657	919	857
South Carolina	1,174	971	1,267	1,582	1,462
Georgia	1,938	1,852	1,885	2,118	1,679
Alabama	1,026	553	521	789	717
Mississippi	926	800	886	1,193	951
Louisiana	337	441	630	583	303
Texas	3,069	3,563	3,042	2,610	2,960
Oklahoma	622	813	955	585	1,002
Arkansas	790	1,103	953	957	867
Tennessee	296	378	239	318	301
Sundries	153	196	213	252	226
Total	11,068	11,364	11,248	11,906	11,325

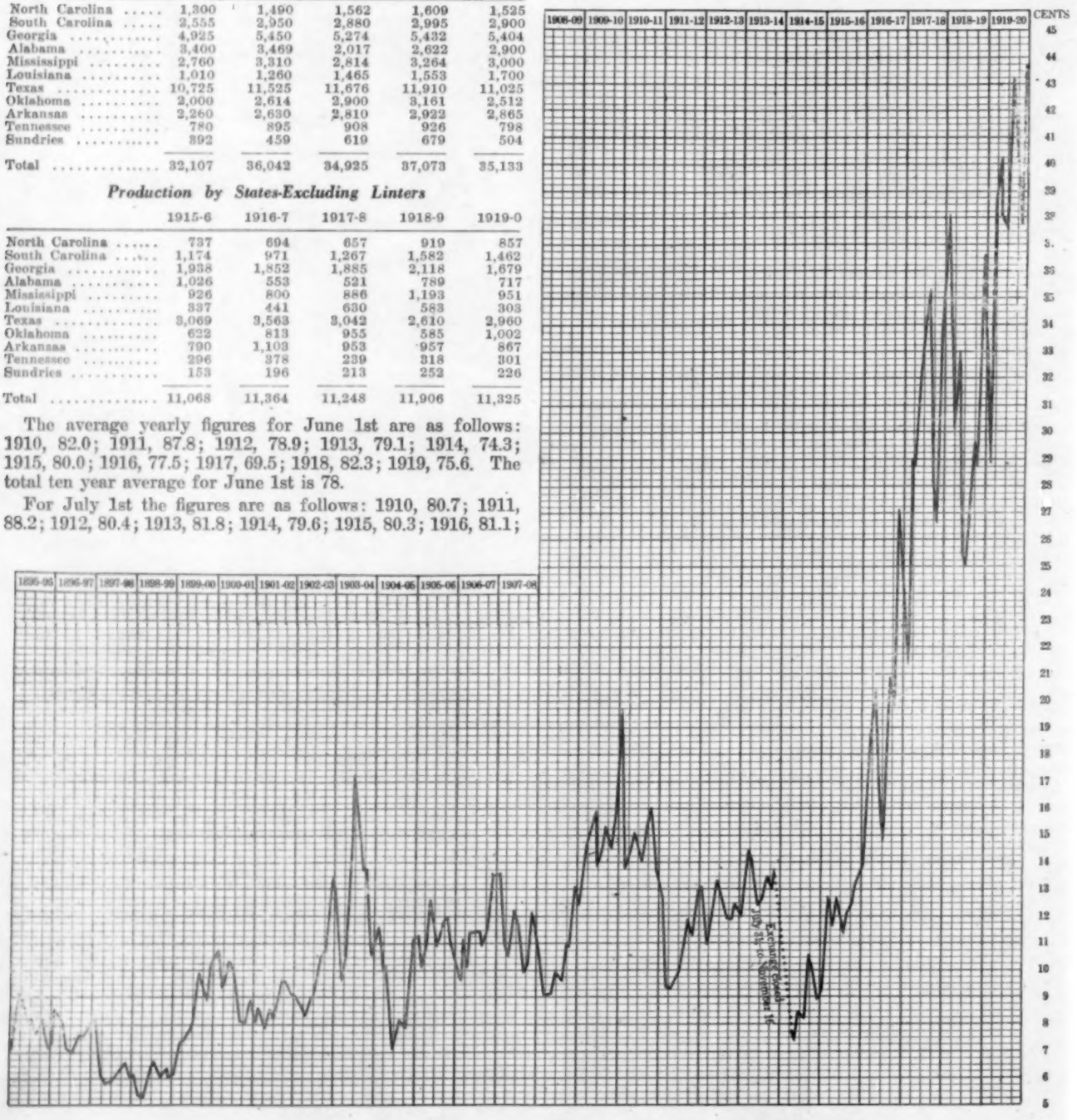
The average yearly figures for June 1st are as follows: 1910, 82.0; 1911, 87.8; 1912, 78.9; 1913, 79.1; 1914, 74.3; 1915, 80.0; 1916, 77.5; 1917, 69.5; 1918, 82.3; 1919, 75.6. The total ten year average for June 1st is 78.

For July 1st the figures are as follows: 1910, 80.7; 1911, 88.2; 1912, 80.4; 1913, 81.8; 1914, 79.6; 1915, 80.3; 1916, 81.1; 1917, 70.3; 1918, 85.8; 1919, 70.0. The total ten year average for July 1st is 79.8.

For August 1st they are as follows: 1910, 75.5; 1911, 89.1; 1912, 76.5; 1913, 79.6; 1914, 76.4; 1915, 75.3; 1916, 72.3; 1917, 70.3; 1918, 73.6; 1919, 67.1. The total for August 1st for the ten year period is 75.6.

September 1st are the following: 1910, 72.1; 1911, 73.2; 1912, 74.8; 1913, 68.2; 1914, 78.0; 1915, 69.2; 1916, 61.2; 1917, 67.8; 1918, 55.7; 1919, 61.4. The total average for ten September 1sts is 68.2.

October 1st figures are: 1910, 65.9; 1911, 71.1; 1912, 69.6; 1913, 64.1; 1914, 73.5; 1915, 60.8; 1916, 56.3; 1917, 60.4; 1918, 54.4; 1919, 54.4. The average for October 1st for the last ten years is 63.0.



MIDDLING UPLANDS IN NEW YORK (SPOT COTTON)—QUARTERLY HIGHS AND LOWS

		1895-96	1896-97	1897-98	1898-99	1899-00	1900-01	1901-02	1902-03	1903-04	1904-05	1905-06	1906-07	1907-08	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15	1915-16	1916-17	1917-18	1918-19	1919-20
Visible Supply of American Cotton at End of Season		1,086	770	1,366	1,974	474	859	793	443	461	1,594	864	1,285	969	1,439	763	823	1,359	1,068	1,671	3,282	2,729	1,504	1,932	3,177	2,754
Acreage planted to Cotton		20,191	23,445	24,320	24,967	24,275	25,421	27,950	27,878	28,907	31,730	27,000	32,049	32,060	33,370	32,292	33,418	36,681	34,766	37,458	37,406	32,107	36,052	34,925	37,073	35,135
Bureau Condition Reports	June 1st	81.0	97.2	83.5	89.0	85.7	82.5	81.5	95.1	74.1	83.0	77.2	84.6	70.5	79.7	81.1	82.0	87.8	78.9	79.1	74.3	80.0	77.5	69.5	82.3	75.6
	July 1st	82.3	92.5	86.0	91.2	87.8	75.8	81.1	84.7	77.1	88.0	77.0	83.3	72.0	81.2	74.6	80.7	88.2	80.4	81.8	79.6	80.3	81.1	70.3	85.8	70.0
	August 1st	77.9	80.1	86.9	91.5	84.0	76.0	77.2	81.9	79.7	91.6	74.9	82.9	75.0	83.0	71.9	75.5	89.1	76.5	79.6	76.4	75.3	72.3	70.3	73.6	67.1
	September 1st	70.8	64.2	78.3	79.8	68.5	68.2	71.4	64.0	81.2	84.1	72.1	77.3	72.7	76.1	63.7	72.1	73.2	74.8	68.2	78.0	69.2	61.2	67.8	55.7	61.4
	October 1st	65.1	60.7	70.0	75.4	62.4	67.0	61.4	58.3	65.1	75.8	71.2	71.6	67.7	69.7	58.5	65.9	71.1	69.6	64.1	73.5	60.8	56.3	60.4	54.4	54.4
	Deterioration June to October	15.9	36.5	13.5	13.6	23.3	15.5	20.1	36.8	9.0	7.2	6.0	13.0	2.8	10.0	22.6	16.1	16.7	9.3	15.0	0.8	19.2	21.2	9.1	27.9	21.2
U.S. Census Bureau Reports of Cotton Ginned (with percentage of total ginned to dates specified)	September 1st									17 (0.2%)	375 (2.8%)	477 (4.5%)	408 (3.1%)	200 (1.8%)	402 (3.1%)	388 (3.9%)	353 (3.1%)	771 (5.0%)	731 (5.4%)	799 (5.7%)	480 (3.0%)	464 (4.2%)	851 (7.5%)	615 (5.5%)	1,038 (8.7%)	143 (1.3%)
	September 25th											2,356 (22.4%)	2,057 (15.8%)	1,533 (13.9%)	2,591 (19.8%)	2,568 (25.5%)	2,312 (20.0%)	3,677 (23.6%)	3,007 (22.3%)	3,247 (23.2%)	3,394 (21.3%)	2,904 (26.2%)	4,082 (35.9%)	2,512 (22.3%)	3,771 (31.7%)	1,835 (16.2%)
	October 18th								5,683 (53.7%)	3,706 (37.7%)	6,418 (47.7%)	4,991 (47.6%)	4,932 (38.0%)	4,420 (40.0%)	6,296 (48.1%)	5,531 (54.9%)	5,424 (46.9%)	7,759 (49.9%)	6,874 (51.0%)	6,974 (49.9%)	7,620 (47.9%)	5,709 (51.6%)	7,303 (64.3%)	5,574 (49.6%)	6,811 (57.2%)	4,929 (43.5%)
	November 1st											6,458 (61.5%)	6,906 (53.2%)	6,129 (55.4%)	8,192 (62.6%)	7,018 (69.7%)	7,346 (63.5%)	9,971 (64.1%)	8,869 (65.8%)	8,830 (63.2%)	9,827 (61.8%)	7,379 (66.7%)	8,624 (75.9%)	7,185 (63.9%)	7,777 (65.3%)	6,305 (55.7%)
	November 14th									6,815 (69.4%)	9,787 (72.8%)	7,501 (71.5%)	8,562 (65.9%)	7,301 (66.0%)	9,596 (73.3%)	8,112 (80.5%)	8,780 (75.9%)	11,313 (72.7%)	10,300 (76.4%)	10,445 (74.7%)	11,668 (73.4%)	8,771 (79.2%)	9,615 (84.6%)	8,571 (76.2%)	8,706 (74.1%)	7,601 (67.1%)
	December 1st											8,690 (82.8%)	10,028 (77.2%)	8,343 (75.5%)	11,009 (84.1%)	8,877 (88.1%)	10,140 (87.7%)	12,817 (82.4%)	11,885 (87.9%)	12,088 (86.5%)	13,073 (82.2%)	9,704 (87.7%)	10,352 (91.1%)	9,714 (86.4%)	9,571 (80.4%)	8,844 (78.1%)
	December 13th								8,906 (84.1%)	8,526 (86.8%)	11,971 (92.0%)	9,296 (88.6%)	11,113 (85.6%)	9,284 (84.0%)	11,904 (91.0%)	9,358 (92.9%)	10,695 (92.5%)	13,771 (88.5%)	12,439 (92.2%)	12,927 (92.5%)	13,972 (87.8%)	10,306 (93.1%)	10,839 (95.4%)	10,132 (90.1%)	10,281 (86.3%)	9,397 (83.0%)
	January 1st											9,725 (92.7%)	11,741 (90.4%)	9,962 (90.0%)	12,465 (95.3%)	9,647 (95.8%)	11,085 (95.8%)	14,317 (92.1%)	12,907 (95.7%)	13,348 (95.5%)	14,443 (90.8%)	10,637 (96.1%)	11,039 (97.1%)	10,435 (92.8%)	10,774 (90.5%)	10,009 (88.4%)
	January 16th									9,486 (90.6%)	12,768 (94.9%)	9,990 (95.2%)	12,176 (93.8%)	10,340 (93.5%)	12,666 (96.8%)	9,788 (97.2%)	11,253 (97.3%)	14,516 (93.3%)	13,089 (97.0%)	13,582 (97.1%)	14,916 (93.8%)	10,782 (97.1%)	11,138 (98.0%)	10,571 (94.0%)	11,049 (92.8%)	10,307 (91.0%)
	Final (Lint Cotton)					9,393	10,102	9,583	10,588	9,820	13,451	10,495	12,983	11,058	13,086	10,073	11,568	15,553	13,489	13,983	15,906	11,068	11,364	11,248	11,906	11,328
	Linters					115	143	166	196	196	246	230	322	268	346	313	398	556	602	631	832	930	1,328	1,131	929	611
	Total (Lint and Linters)					9,508	10,245	9,749	10,784	10,016	13,697	10,725	13,305	11,326	13,432	10,386	11,966	16,109	14,091	14,614	16,738	11,998	12,692	12,379	12,835	11,937
Yield per Acre (Pounds)		169	178	222	221	186	201	186	185	169	209	186.1	202.5	178.3	194.9	154.3	170.7	207.7	190.9	182.0	209.2	170.3	156.6	159.7	159.6	161.5
Commercial Crop		7,147	8,706	11,216	11,256	9,422	10,339	10,768	10,674	10,002	13,654	11,234	13,540	11,441	13,817	10,513	12,075	16,101	14,104	14,552	15,108	12,938	12,941	11,907	11,640	12,443
U.S. Census Bureau	Consumption by American Mills (Linters and Foreign Cotton included)	2,500	2,841	3,472	3,672	3,687	3,604	4,080	4,187	3,981	4,523	4,909	4,965	4,539	5,241	4,799	4,705	5,368	5,786	5,885	6,009	7,277	7,668	7,708	6,223	6,760
	Exports	4,762	6,124	7,811	7,627	6,168	6,807	6,870	6,913	6,234	9,057	6,763	8,505	7,573	8,574	6,339	7,781	10,682	8,801	8,915	8,545	6,204	5,739	4,476	5,606	6,598
World's Consumption of American Cotton		10,009	10,309	10,050	10,759	10,995	10,171	10,657	10,876	10,083	11,838	12,166	12,611	12,112	13,157	11,754	12,054	14,515	14,715	14,541	13,834	14,813	13,906	12,282	10,600	12,735
Foreign Statistics	Visible Supply all kinds at end of season	2,395	1,382	1,009	1,673	2,180	712	1,113	1,018	709	774	1,899	1,138	1,694	1,307	1,677	1,349	1,621	2,003	2,596	3,181	4,702	2,812	3,033	4,773	4,691
	Indian Acreage	16,246	15,983	13,683	14,602	11,885	14,231	14,506	16,581	18,025	19,918	20,401	22,488	21,630	19,999	20,545	22,596	21,615	22,028	25,020	24,595	17,967	21,745	24,781	20,497	23,000
	Indian Crop (500 lb. Bales)	2,332	1,733	2,123	2,512	1,675	2,162	2,649	3,000	2,863	3,061	3,390	3,926	2,498	2,953	3,774	3,082	2,630	3,688	4,052	4,186	3,055	3,602	3,229	2,937	4,716
	Egyptian Acreage	1,015	1,091	1,172	1,164	1,197	1,277	1,297	1,324	1,383	1,491	1,626	1,564	1,664	1,703	1,619	1,664	1,776	1,787	1,789	1,822	1,231	1,718	1,741	1,365	1,761
	Egyptian Crop (500 lb. Bales)	1,041	1,165	1,296	1,107	1,290	1,077	1,262	1,157	1,289	1,251	1,181	1,377	1,433	1,337	1,000	1,506	1,463	1,492	1,522	1,286	952	1,012	1,250	950	1,215
	World's Consumption all kinds	11,605	11,880	12,889	14,015	13,773	13,416	14,415	14,478	14,310	15,612	16,435	16,999	16,281	17,164	16,189	16,750	18,566	19,544	19,858	18,747	20,344	18,925	17,100	15,689	17,555

ALL STATISTICS IN THOUSANDS OF BALES OR THOUSANDS OF ACRES

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Misleading Advertising

An attempt to deceive unwary readers by the use of the name, "Kelly-Greenfield Rubber Company" as a play upon the name of the nationally-known "Kelly-Springfield Tire Company" is the subject of a special report of the National Vigilance Committee of the Associated Advertising Clubs of the World, following an investigation.

"The Kelly-Greenfield Rubber Company, located at 321 East 33d Street, Chicago, Ill., offered tires to the public through the newspapers," says the association. "The advertising was obviously planned to parallel the claims of the nationally recognized Kelly-Springfield Tire, by emphasizing a high-mileage adjustment basis and the puncture-proof qualities of the tubes. The fact that the tires were "reconstructed" was subordinated by means of wording and small print."

The association points out the alleged misleading character of this practice by detailing the case of a reader who was deceived by the similarity in names and the description of the tires. He answered the advertisement, ordered a set of tires and mailed a check made out to the Kelly-Springfield Tire Company. When the cancelled check was returned it bore the endorsement of the Kelly-Greenfield Company. The tires were delivered, after nearly two months of delay, and were found to be "reconstructed" tires of such poor quality that the retread could be easily peeled away from the apparently rotten fabric. Refund was demanded and refused.

In reporting the investigation the Advertising Association says that, "Greenfield, a member of the firm, claimed a right to the name Kelly-Greenfield because once at least, he had been called "Kelly" as a nickname. This was the only explanation offered for the imitation of the name of the Kelly-Springfield Tire Company."

Frank Hill Leaves Kenyon

Franklin G. Hill for many years Eastern manager for the Republic Rubber Company, but for the past few months Eastern sales manager for the C. Kenyon Company, of Brooklyn, N. Y., has announced his retirement from the Kenyon Company, effective November 1.

Mr. Hill is one of the real veterans of the tire industry, having been associated with the Diamond Rubber Company, also the Continental Coutchouc Company in the early days. Mr. Hill became identified with the Republic Rubber Company in 1907 and was with them until August 1 of this year, when he left them to join the Kenyon Company. Mr. Hill makes no announcement now of his future plans but will pobably have some interesting announcement to make in the near future.

Fire at Gates Plant

Fire of unknown origin which started on October 7 in a scrap rubber heap at the Gates Rubber Company, Denver, Colo., for a time menaced the benzol storehouse, in which 35,000 gallons of this high explosive was stored. Only prompt action of the emergency fire fighters at the plant prevented a very serious conflagration. Besides the loss of the scrap rubber, the fence surrounding the north edge of the plant was also destroyed. According to John Gates, secretary of the company, the loss is $5,000.

Nightsticks Ivory or Rubber?

Two Belgians Want to Know.

The police of the West Forty-seventh Street Station received a letter recently, written in English, from two men living in Antwerp, Belgium, seeking information about the nightstick carried by the New York policemen. A wager had been made that it is either rubber or ivory, according to the letter, and the men decided to write to the police to ascertain the exact composition of the club. The letter follows:

Antwerp, Belgium, Oct. 1, 1920.

Dear Sirs—In an argument we have made a bet. Perhaps you may help us in the matter. We should like to know what the club of the New York policemen is made of—ivory or rubber. Hoping you will grant our favor, we are

Yours truly,

M. E. RUYSSEVELDT,

E. NELSSEN.

All bets are off, the police say, as the nightstick is neither ivory nor rubber, but locust wood.

Incidentally we are willing to place a bet of our own that they have been used on ivory. We are not sure about rubber.

Ajax District Managers Meet

Optimism—with a capital "O"—was the outstanding feature of the annual meeting of district managers of Ajax Rubber Company, Inc., held recently at the company's general offices, 218-222 West 57th Street, New York City.

Discussing 1921 prospects, Joseph C. Weston, vice-president and general manager, characterized the tire market as an ever-expanding one. Expressions of enthusiasm were voiced by every one of the men who are in New York from all parts of the United States.

Horace De Lisser, president of Ajax and Mr. Weston, as well as the assembled field executives, prophesy an exceptionally good year for the manufacturer who makes good tires, and for the dealer who sells them.

Miller Branch in Kansas City

The Miller Rubber Company of Akron, Ohio, will place a distributing branch in Kansas City, Mo., November 1. The company closed a five year lease by which it is acquiring a four story and basement building containing twenty-five thousand square feet of floor space at Union avenue and Hickory street.

To Build Ideal Highway

The appointment of a committee of technical experts to decide on specifications is the latest step in the movement to build on the Lincoln Highway an "ideal section" with funds provided by the United States Rubber Company. No announcement has yet been made of the exact spot where the ideal section will be built. With Iowa, Illinois, Indiana, Ohio, Pennsylvania and New Jersey all in active competition for the honor, this announcement is awaited with interest. It is stated authoritatively that a careful study of the situation has narrowed down the possibilities of location to a point in Pennsylvania, one in Ohio and one in Western Indiana.

The plan followed by the Board of Directors of the Lincoln Highway Association in appointing their "Ideal Section" Technical Committee was, briefly, to have represented in the deliberations of the committee, every class of technician with an interest in the development of American Highways. These classes from which were selected the men to act upon the committee, comprise: The Highway Engineering Department of the United States Government, the Engineering and Motor Transport Corps of the Army, the State Highway Department officials and engineers, country highway officials and engineers, professors of highway engineering, truck transportation interests, automotive engineers and the great class of American tourists.

Allen Tire Soon on Market

Announcement has been made by the Allen Tire & Rubber Company, Allentown, Pa., to the effect that the firm expects to be in production during November. Wilmer Dunbar, president and production manager of the company is a man of thirty-five years experience in the rubber business and is ably assisted by J. T. Leathers, treasurer, and Thomas Johnson, secretary. Eighty-seven different men are financially interested in this company and these have had from three to thirty years experience in the rubber industry.

Pigment Prices Increase on Coast

Increased freight rates and higher handling charges have compelled the Mineral Point Zinc Company to advance its Los Angeles and San Francisco warehouse prices for less carload lots of zinc oxide, albalith and lithopone one-half a cent per pound. The change was effective October 15. This action automatically increases the price differential from one and one-half to two cents per pound above carload barrel price at shipper's works.

Interlocking to Buy Factory

Plans are under way for the Interlocking Cord Tire & Belting Co. to purchase another rubber factory at Astabula, officials of the company said recently.

Stockholders have voted an increase in capitalization from $1,000,000 to $5,000,000.

News from the Rubber Metropolis

Swinehart in the Mechanical Field—Rutherford Twenty Years with Goodrich—Reduction in Tire Prices—Flanagan with Rotary Tire—Conditions in Akron Improve—Miller Sales Increase

Swinehart in Mechanical Field

Although directors of the Swinehart Tire & Rubber Co., Akron, O., have deferred payment of dividend on the common stock, they have declared the regular quarterly dividend on the preferred which is payable December 15. This action was taken so the company might conserve its resources at this time when collections are reported slow and demands upon the company heavy.

In his letter to stockholders Thomas F. Walsh says:

"In common with other manufacturers the company finds business in pneumatic tires curtailed but demand for solid tires continues good. The company will soon place upon the market one or two mechanical lines which should stabilize the business.

"The company in the past when it has been found necesary to defer dividends upon the common stock, reimbursed stockolders at a later date, and it is expected when easier money conditions obtain and business again becomes normal that the same policy will be pursued.

"Swinehart is not committed under contract for rubber, fabric or other material at high prices, but is buying its requirements at the present abnormally low prices. We do not share in the pessimism now so often expressed, but look for a gradual resumption in the demand for tires and the return of normal conditions in the rubber trade."

Rutherford Twenty Years at Goodrich

W. O. Rutherford, vice-president in charge of sales of the B. F. Goodrich Rubber Company, is one of the youngest officials in the automotive industry and at the same time one of the oldest in point of service. As proof of his extended work in the industry, Mr. Rutherford now proudly wears a Goodrich twenty-year service pin. He completed his twentieth year this fall and was initiated into the Goodrich Twenty-Year-Service-Order with thirty-eight other "new" twenty-year veterans.

Mr. Rutherford worked up to his present position from the ranks, winning each promotion through sheer ability. He entered the employ of the Goodrich in 1900 in a minor position in the sales department. Later he was sent to Detroit to look after the company's interest in that city, and a year later was promoted to the position of manager of the company's Denver branch.

From the west, Mr. Rutherford was called back to the central states and sent to Buffalo where he had charge of the company's affairs for eight years. In 1910 he was transferred to the home office at Akron where he was made assistant to Vice-President H. E. Raymond. By successive steps he advanced from that position to vice-president in charge of sales.

Despite this long service record, Mr. Rutherford is still a young man. He

W. O. Rutherford

registered in the last draft during the war and is still on the "near-side" of the fifty year mark.

Reduction in Tire Prices

The long expected break in tire prices has come at last. Announcement has been made by a number of tire companies, large and small throughout the country of reductions the greater number of which were effective on or about November 1st. Among the firms which have announced reductions are: United States Tire Co., Goodyear Tire & Rubber Co., (Reductions to dealers), Standard Tire Co., Dixie Rubber Co., Iowa Cord Tire Co., Progressive Tire & Supply Co., McCreary Tire & Rubber Co., Rotary Tire & Rubber Co., Delion Tire & Rubber Co., Master Tire & Rubber Co., Lion Tire & Rubber Co.

A number of letters have been received from tire companies throughout the country stating that they would maintain the prices which went into effect following the general advance last spring.

Flanagan With Rotary Tire

J. D. Flanagan, formerly in charge of the development of tires, tubes and accessories of the Firestone Tire & Rubber Company has resigned to accept the position as superintendent of The Rotary Tire & Rubber Company at Zanesville, Ohio, succeeding William Sherbondy, who has resigned.

Conditions in Akron Improve

(Special Akron Correspondence)

Outward signs in Akron point to a picking up in activity at the rubber factories both in the city and the small towns in the Akron district. Manufactured stocks of automobile tires have been greatly depleted since the slowing up of production started several months ago, and now some companies are finding themselves out of certain sizes. Workmen have been put back at their old places to make these sizes. There is, however, no indication that surplus stocks are being built up. Tires are being manufactured only when orders have been received or inquiry has been made for certain sizes.

Rumors of resumption in activity in the rubber factories are as numerous in Akron now as they were when the slowing down was started. At that time the rumors greatly exaggerated real conditions. The same thing is true now. Every time a man is hired, rumor has it that hundreds are returning to a certain shop. If a department is reopened, rumor has it that thousands are returning to their old places and so on down the line.

There is no doubt, however, but that the Akron rubber companies are rounding out the greatest years in the history of the rubber industry. Business records made this year, it is believed, will be hard to equal.

The Goodyear Tire & Rubber Co. closed its fiscal year October 31 and announcement from the company offices showed sales for the twelve months ending on that date were in excess of $205,000,000 as compared with $167,000,000 last year.

The Firestone Tire & Rubber Co. reports sales for its fiscal year ending November 1 as between $105,000,000 and $108,000,000 as compared to $91,000,000 last year and $75,000,000 the year before.

Miller Sales Increase

(Special Akron Correspondence)

The Miller Rubber Co. does not close its fiscal year until December 31, but announces that sales up to November 1 were $27,440,743 as compared to $27,116,588 during the entire year of 1919. Aggregate sales for the entire year of 1920 should reach the $31,000,000 mark at the Miller Rubber Co., according to estimates made by officials of that company.

No estimates of the total sales for the year has been announced by officials of the B. F. Goodrich Rubber Co., but it is said that the business of that company for the first ten months of the present year were in excess of last year's record business of $143,000,000.

L. L. King Returns from Europe

(Special Akron Correspondence)

Lucien L. King, advertising manager of the Goodyear Tire & Rubber Co., has returned from a five-months business trip to Europe during which he made a survey of business conditions in the countries where the Goodyear has an export trade.

National Safety Council Meets

Members of Organization Discuss Problems and Elect Officers at Milwaukee, Wis., September 27-October 1—Rubber Section Holds Interesting Three Day Session

Hundreds of shops, factories and industrial plants of all sorts, hitherto lacking interest in safeguarding their workers, will be organized for safety for the first time—hundreds more which had already instituted safety work will see great improvements within the next year—thousands of lives will be saved—thousands of crippling accidents will be prevented and an immeasurable amount of human suffering averted—millions of dollars will be conserved, and industrial production will be increased vitally, which will be reflected in a marked reduction of prices and consequent general benefit to the people of the country as a whole—all these things are predicted by officials of the National Safety Council as the probable results of the Ninth Annual Safety Congress held at Milwaukee, Wis., September 27 to October 1.

In every way, it was generally agreed this was the greatest congress in the history of the safety movement—in the numbers who attended and the diversity of interests they represented, in the spirit of hunmanization which prevailed through all the sections of the convention, in enthusiasm, and in actual accomplishments for the cause of safety during the five days' sessions.

From the opening session until the close of the week one big fact was constantly impressing itself upon the minds of the men who fathered the movement in Milwaukee eight years ago and who have attended each of the annual congresses since then, and that was—to quote C. W. Price, general manager of the Council—"The conviction on the part of delegates that safety, as a permanent national movement, had arrived; that from now on the work of the National Safety Council will assume such proportions that no longer will it be a question of how to open the doors, but rather that of deciding which of the many open doors to enter."

More than 3100 persons registered, which means that at least that number attended the regular sessions of the Congress.

So much for general attendance. Approximately every sectional chairman, also, reported not only larger attendance than at any earlier Congress, but a greater interest, and it was characteristic of the sectional meetings this year that at least one speaker in each section was a man of national prominence and that these men did not run off after delivering their talks, but stayed through the meeting and participated in the discussion. This was true of such men as Samuel O. Dunn, editor of Railway Age and president of the Associated Business Papers who spoke for the Steam Railroad Section, of James Newton Gunn, vice president of the United States Rubber Company, and president and general manager of the United States Tire Company who spoke before the Rubber Section, of Dr. Otto Geier, president of the American Association of Industrial Physicians and Surgeons and the other noted industrial physicians who addressed the joint meeting of the Health Service Section of the Council and the American Association of Industrial Physicians and Surgeons.

The pace for the convention was set by a great mass meeting held Monday, the opening day—the first of this character to be conducted at a safety congress—which was unusually successful not only because of the large attendance of Milwaukee citizens but because of the high pitch of enthusiasm and interest awakened by such talented speakers as Marcus A. Dow, general safety agent of the New York Central Lines and Dr. Franklin C. Wells, Medical Director of the Equitable Life Assurance Society of the United States.

More than 800 men and a few women, all engaged in safety work, were on hand at the round table meeting Tuesday morning, and dozens of most valuable suggestions were made in the free for all discussion on "New Ways of Keeping Up Interest in Safety."

Many more plants this year sent superintendents and foremen to the Congress in addition to their safety experts than ever before.

More safety moving pictures were shown than ever before.

The following officers were elected for the ensuing year: Charles P. Tolman, president; Mr. Tolman is Chief Engineer of the National Lead Company, New York City; First Vice President, W. H. Cameron, Secretary-Treasurer of the Workmen's Compensation Bureau; New York City; Second Vice-President, L. A. DeBlois, Manager of Safety Section, E. I. du Pont de Nemours & Co., Wilmington, Del.; Third Vice-President, W. E. Worth, Assistant Manager, Industrial Relations Department, International Harvester Company, Chicago, Ill.; Fourth Vice-President, John A. Oartel, Safety Engineer, Carnegie Steel Company, Pittsburgh, Pa.

The following officers of the staff at the National Headquarters in Chicago were re-elected: C. W. Price, general manager; Sidney J. Williams, secretary; W. H. Frater, treasurer and R. T. Solensten, assistant secretary.

Ajax Promotes Van Riper

Announcement has just been made in New York of the appointment of L. M. Van Riper as western sales manager of the Ajax Rubber company, Inc., with headquarters in Chicago.

Mr. Van Riper is widely known in the Chicago territory, having served as district manager in Chicago for the United States Tire company. For a considerable time past he has been district manager in Detroit for Ajax.

The Rubber Situation in England

"These are construction days for everything pertaining to rubber in the British Empire," reads a London dispatch to the Wall Street Journal.

"It is estimated that the 1920 world's production of rubber will be 400,000 tons and the most liberal consumption figures are put at 350,000 tons, leaving a surplus of 50,000 tons which, according to those in the trade, will grow considerably in 1920 unless drastic plans for reduction of output are put into effect.

"The Rubber Growers' Association is receiving a satisfactory response to its pleas for a twenty per cent reduction in output, about eighty per cent of the English and Dutch companies having approved of the scheme. In 1918, when the same voluntary plan was put into effect output was curtailed 35,000 tons, and it is hoped that next year it will bring about a reduction in output of approximately 100,000 tons.

"The British rubber industry actually represents capital of some 400,000,000 pounds, of which somewhat less than one-quarter is invested in plantations. However, with plantation quotations now at one shilling and five pence a pound against twelve shillings and nine pence in the halcyon days ten years ago when the great rubber boom attracted the whole British speculative and investing world, it is not surprising that one big rubber financier said it would be hard to get money for new plantations under ten per cent.

With the current price of one shilling and five pence, which means an average of probably less than one shilling and three pence for the entire crop, a few companies can make a profit while a great many will show deficits. The United States consumes approximately seventy-five per cent of the world's production. Not only have American manufacturers cut down their takings of rubber but there have been important resales to Great Britain so, as one raw rubber dealer puts it, 'with our shelves well stocked and seventy-five per cent of our customers not only refusing to buy but returning goods the outlook can hardly be termed rosy.'

"There is a clamor growing in raw rubber circles that British manufacturers wake up and compete with the U. S. A. in the matter of rubber goods. One expert points out that while the United States with 100,000,000 people consumes seventy-five per cent of the world's rubber output, the United Kingdom with 50,000,000 population consumes somewhat less than ten per cent. He offers April, 1920, statistics to show that exports of rubber boots and shoes from the U. S. A. were 770,195 pairs, against 80,628 from the United Kingdom, and that in that month the former country exported 1,000,000 pounds worth of tires against shipments of 552,000 pounds from the latter. Thus England realizes that she must turn to more extensive rubber manufacturing, not only to compete with the States in that line, but in order to protect her tremendous investments in plantations."

News from the Industry at Large

Prudential Buys Great Republic—Dunlop Tire Plant Progresses—Climax Buys Factory—Marks with van der Linde—Ardmore Factory Resumes

Prudential Buys Great Republic

The Great Republic Tire & Rubber Manufacturing company of McAlester, Okla., has been sold to the Prudential Tire and Rubber company, a Delaware corporation, operating three tire and rubber plants at Chippewa Falls, Wis., Sycamore, Wis., and Springfield, Ill. The sale is said to involve $327,000.

The McAlester plant is expected to resume operations at once, following a suspension of several months. The new company is headed by Fred A. Sieberling who is connected with the Goodyear Tire & Rubber Company. The deal has been in progress for several weeks and began with a view of consolidating the Great Republic Company with the Prudential company. A change transpired later and the plant was sold outright, the proposition being ratified by the stockholders.

Dunlop Plant Progresses

The accompanying picture of one of the units of the new Dunlop plant at Buffalo gives a very good idea of the type of construction adopted. It also gives an exceptionally good general view of the buildings, and indicates the rapidity with which the plant has been erected as well as the very large amount of ground covered—approximately thirty-five acres.

Exceptions to the single story plan are the large reinforced concrete warehouse of four stories and the washing and mixing shop, which has to provide for storage of materials—inasmuch as after mixing rubber, it has to age for a certain length of time before going on for further operations. The fabrication units, however, are all of the single story monitor type, although this is not in accordance with previous practice in the tire industry.

The reasons for this departure on the part of Dunlop were several:

In the first place, the monitor type of building gives additional advantages in the way of lighting and ventilation. Floor space is all useful floor space, and as compared with multi-floor buildings, no arrangements have to be made for stairways, elevators, hoists, etc.

With single floor construction it is much easier to adhere to a definite sequence of operation and enable a product to pass from one end of the plant where it is received as raw material to the opposite and where it is finished and ready for shipment.

Furthermore, it obviates the necessity of putting heavy plant machinery on the ground floor of the building and transporting products to other floors which may not be in the most efficient line of operation.

The fact that in each building every process is in direct view of the process immediately following or preceding it, has a very pronounced effect on simplifying and lessening the amount of labor involved, in proportion to the output of the product.

Doubtless, the combination of the long experience and the recognized ability of the English Company with the knowledge and ability of the operating officials, who have all been trained in the American tire industry, will produce other interesting departures from the established practice of either country. In the matter of one story against multi-story building, there is a precedent in the latest and modern plant of the Dunlop Tire & Rubber Company, Ltd., which is in actual operation at Fort Dunlop near Birmingham, England.

CONSTRUCTION WORK ON DUNLOP FACTORY, BUFFALO, N. Y.

Climax Buys Plant

The Climax Rubber Co., which had proposed to establish a manufacturing plant in Columbus for the Climax Compression Inner Tube, has abandoned the project, due to building conditions, and has purchased the plant of the K. & W. Rubber Co., in Delaware and will take immediate possession.

It is not the intention of the Climax company to immediately devote the plant to the manufacture of the Climax Compression Tube. The Maxotires, innertubes and patches which have been manufactured at Delaware for two years will be a product, the Kirchbaum brothers having retained a large interest in the concern. The plant of the Climax company, for several years in operation at Huntington, W .Va., will be dismantled and the equipment transferred to the Delaware plant.

Marks with van der Linde

Announcement has been made that Arthur H. Marks is again taking an active personal interest in rubber manufacturing. Mr. Marks has acquired a large interest in van der Linde Rubber Company, Ltd., of Toronto, Canada, and, besides being on the directorate is vice-president of the company.

The van der Linde Rubber Company has made a wonderful record. Starting manufacturing in 1917, the organization has developed into one of the most prominent Canadian companies, manufacturing various lines of goods but more particularly the V. D. L. line of tires which are the highest-priced made in Canada.

The V. D. L. radio cord made its first appearance on the market in 1919, the 30 x 3½ and 31 x 4 clincher radio cord being the original light-car cord made in Canada.

This company's export business has been developed until, now, V. D. L. tires are sold in nearly every country where there are automobiles.

The factory manager of the van der Linde Rubber Company, Victor van der Linde, was, until his resigning at the end of 1918, associated with the B. F. Goodrich Company as development manager.

Ardmore Factory Resumes

The management of the Ardmore Akron Rubber Tire company announces that it will resume operations at its plant in Ardmore, Okla., within a short time. The company had all machinery installed and was ready to resume operation when water conditions in Ardmore caused a temporary postponement.

Rubber Broker Moves

Announcement is made by Wallace L. Gough, crude rubber broker, that he is now located at 12 State St., New York City, his former address being 16 Exchange Place.

Niagara Falls Power for Dunlop

The stupendous job being performed by the nation's greatest hydro-electric plant, at Niagara Falls, is given new emphasis every time another great industrial enterprise is harnessed to it.

One of the latest is the plant of the Dunlop Tire & Rubber Corporation of America, a fifteen million dollar factory located a mile north of Buffalo, N. Y. The manufacture of tires requires a great deal of power, in any case—and this particular company will soon be one of the largest in the field, with a production capacity, which will compare favorably with that of the other large manufacturers of the industry. The factory units cover thirty-five acres of actual floor space. A part of the power will come from Niagara Falls direct, the balance being furnished by the steam plant of the Buffalo General Electric Company.

The initial installation at the Dunlop plant will require a total of 253 electric motors in all sizes, having an aggregate rating of 16,500 horse power. In addition there are 15 motor-generator sets with a total capacity of 1260-horsepower, and nine synchronous converters of total capacity of 990 kw. Most of these will be constant speed alternating current motors, among them being twelve 500-horsepower synchronous motors driving lines of masticating and mixing mills and eighteen 250-horsepower synchronous motors driving warming mills.. The variable speed motors are driven by direct current which is supplied from synchronous converters located in the distributing stations, of which there are eight, in the factory. The largest of the direct current motors are of 100-horsepower and 60-horsepower, driving rubber strip and tread calenders respectively. The current comes to the plant at a tension of 12,000 volts and is received at a central sub-station of two stories, 85 x 110 feet in extent of ground plan, where it is reduced by the transformers to 2300 volts and then distributed through an underground cable system through seven sub-stations, each of which is 17 x 72 feet in extent and two stories high. Where alternating current is used, of course, there is merely a reduction of voltage through additional transformers, but in some of the substations there will be converters to make the change to direct current.

In addition there is a main boiler house 61 x 125 feet, with two stories and and a mezzanine floor, and a one-story pumping station 50 x 125.

Electric power is used to drive the air compressors furnishing the compressed air in the plants as well as the pumps which supply water both for use in the various processes and for fire protection. In addition, electric power is used in the operation of magneto clutches and brakes with which all the large lines of mills and rolls are equipped as a safety-first feature.

Electricity further is responsible for the modern electric fire alarm system, telephone system, and automatic call system by which superintendents and foremen can be located anywhere in the plant at any time. At the present time the complete electrical system has not been entirely installed, but will be in place and in operation before the first of the year. Sub-stations are already under construction and the conduit or subway for the wiring is practically complete.

Surplus Stock of Crude Rubber

The following bulletin was recently issued by the Mid-West Rubber Manufacturers' Association:

OCTOBER 25, 1920

To Members:

We are indebted to the *Trade News Service* of New York for the following significant comments on present and future stocks (estimated) of crude rubber in this country:

"In connection with views recently published as to the production and consumption of crude rubber a number of opinions have been given by the factors in the New York market. While these are for the most part of a bearish nature, there are but few conflicting opinions, since most of the statements are based upon imports and consumption for a known period, viz. the past nine months of this year.

"According to the estimate of one dealer there were 65,000 tons of rubber in store in the United States on January 1, 1920, and arrivals for the nine months ending September 30, 1920, amounted to 192,000 tons, bringing into this market for the entire period a total of 257,000 tons of crude rubber.

"Consumption for the same period amounted to 165,000 tons, estimating 15,000 tons for January up to 30,000 for May when manufacturing was practically at its peak, and receding from that time.

"If this estimate is to be accepted, a surplus would be shown as of October 1, 1920, of 92,000 tons, and on the present limited scale of manufacture, even with decreased imports, there would be an accumulation of rubber in this country at the end of the year in excess of 100,000 tons.

"Recent figures from the Rubber Growers' Association of London show a surplus as of August 31, 1920, amounting to 33,200 tons, and it is estimated that this amount will by the end of the year reach 50,000 tons. Surplus stocks known and estimated for the balance of the year in Singapore, Colombo, Java and Brazilian markets given a total estimated surplus of over 200,000 tons."

It is to be noted in regard to the above estimate, however, that not all of this rubber, or even a great part of it, will be available for trading purposes in the New York market, as the figures given represent not only stocks held in warehouses, but also those in the hands of manufacturers.

It is estimated that 30,000 tons is actually on spot at the present time in New York, but of this amount considerable is already sold. It is difficult to estimate the amount actually available for trading purposes.

Depression in Amsterdam Market

The following report on the condition of the rubber market in Amsterdam was recently published in the Journal of Commerce, New York: The usual depression in the rubber market at Amsterdam is due to the low prices and the consequent lack of desire on the part of the sellers to accept offers, according to a report to the Department of Commerce from Consul Frank W. Mahin at Amsterdam. The low prices are attributed to the reduced demand, especially from the United States. Consul Mahin states this condition was illustrated in the last sale in Amsterdam, where the absence of American buyers was conspicuous. Most of the sales went to Germany, but they were not many. Of about 1,500,000 pounds offered only about 300,000 were sold. This small sale, however, was not so much due to lack of bids as that the bids were too low to satisfy the sellers, many of whom preferred to hold their goods till prices advanced.

The highest price paid at the sale was 37c for 1.1 pounds for hevea standard smoked sheets of the Majang estates, and the lowest price 26c for hevea crepe, IV and V dark gray. It is reported that the Directorate of the Rubber Growers' Association in London has unanimously agreed upon an immediate decrease of 25 per cent in the normal monthly production of rubber on each plantation on account of the prevailing low prices.

Graf Goes to Seattle

Robert E. Graf, formerly service manager of the Phoenix, Ariz., branch of the Goodyear Tire & Rubber Company, has been assigned to the Seattle branch and arrived there from the Los Angeles factory where he has been on duty for the last six months.

Mr. Graf has been with the Goodyear organization for nearly four years. He was in the service for seventeen months, serving with the American Expeditionary Forces in France. He was decorated twice and received two citations. He was with the American Ambulance Corps attached to the French Army.

Gordon Branch in Mexico

Louis Goetting will be away for several weeks on a trip to old Mexico and Cuba in the interests of the Gordon Tire & Rubber Co., of Canton, Ohio. Mr. Goetting is going to establish a branch in Mexico City for The Gordon Tire & Rubber Company export department, of which he is the general export manager. He will return via Vera Cruz and Cuba remaining there for some time to give personally the once over to their increasing business in the Island.

Carlton With Union Chemical

A. S. Carlton, for many years connected with Seaver & Company, of Boston, Mass., will join the Union Chemical Company, 27 Haymarket Square, Boston, on November 1st., as vice-president of the company. Mr. Carlton is considered an expert on carbon, lamp and bone blacks.

MARKETS

Manufactured Rubber Goods

NEW YORK, NOVEMBER 5, 1920

Softness is in evidence in many lines of manufactured rubber goods, and manufacturers are still holding to their policy of restricted output in the fact of a declining market. Demand has shown but little improvement since the closing days of October, and business is still being conducted on a hand to mouth basis, with distributors taking stocks only as actually needed.

In the tire industry, manufacturers predict that the present reduced output will make for an actual shortage in the spring. Stocks of tires in the hands of dealers are estimated at about 6,000,000 tires. If every car and truck owner in the country were to buy just one tire, the supply would thus be unequal to the demand. In other lines of manufactured goods, supplies available for immediate use have showed a proportionate falling off.

Selling pressure on the part of the smaller tire manufacturers is still in evidence, but the pressure is not as heavy as it was a short time ago. Most of the smaller producers have already cleared their stocks of tires made from high cost materials, and their present output is being made from lower priced raw materials, purchased since the recent sharp price declines.

AUTOMOBILE TIRES

Some improvement in the situation, both as to production and finance, is reported. Output on the part of the big companies in Akron is being gradually restored, but the plants are still running at about from 10 to 55 per cent of capacity. With production curtailed to this degree, and unsold stocks being gradually reduced, the outlook for next year is believed to be brighter.

Effective November 1, two of the largest tire manufaturing companies in the country have reduced their prices on all pneumatic and solid tires to dealers and service stations. One company's reductions do not take in inner tubes. The other company has reduced its prices from 12½ per cent on Ford sizes of fabric tires to 10 per cent on the larger sizes of fabric tires, and smaller reductions on cord tires. Solid tires are lowered 10 per cent, and tubes 15 per cent.

Buying of automobile tires by consumers continues to be slow, but dealers are looking for a better market next spring. Stocks in the hands of distributors are not large at present time, when the number of automobiles in the country is considered, it is believed that the many buyers who have been keeping out of the market this season will have to come in next spring for both spares and regulars.

MECHANICAL GOODS

Manufacturers of belting are keeping production down to a bare minimum while prices for raw materials continue to fluctuate. Cotton ducks are down to a much lower basis, but manufacturers do not yet believe that the end is in sight, and are holding off from making any large purchases in the market until prices appear to have reached a stable basis. Prices on manufactured mechanicals are expected to undergo a thorough revision when this occurs.

Buying of airbrake hose for account of the railroads contiues slow, but manufacturers believe that large orders have been made up and will be given to the trade as soon as price fluctuations cease and the market settles down to a basis more nearly approaching normal conditions.

BOOTS AND SHOES

Rubber heel manufacturers are still doing a brisk business, especially on the more popular lines, which are moving out steadily. While the shoe manufacturing trade is not taking its customary supplies, owing to the slow market for new shoes, the volume of business coming in from the repair shops is sufficient to take care of present output of heels. The sales of rubber and composition soles also continue fair, despite recent price reductions on sole leather.

MISCELLANEOUS

Manufacturers of druggists' sundries are doing a good business, and conditions in this branch of the industry are more favorable than in other sections of the manufactured rubber field.

A good demand for rubber toys is reported as the holiday season approaches and manufacturers are busy on their new holiday lines. The American toy industry is expanding rapidly, and thus another use for rubber is being found.

The demand for lower prices on rubber coats and clothing is getting more insistent, and sales are slower than normal for this season of the year. Stores handling the real army-released goods are doing a steady business, while those handling "fake" army supplies are also making good sales of cheap rubber coats which they pass out as army stocks. All of this is hurting the business of the legitimate manufacturers.

Cottons, Yarns and Fabrics

NEW YORK, NOVEMBER 5, 1920

Harvesting of the new crop is progressing steadily, and approximately fifty per cent of the 1920 yield is reported to be in already. Factors in the cotton market are making a concerted action to put as much of the new crop as possible into warehouse, to be held there until the market reaches higher levels. Much of the new crop is being put away in the seed, the factors holding the cotton from the gins. Southern bankers are beginning to come to the aid of the cotton men to some extent, and are loaning them money upon which to bale and store their cotton.

Mill interests are watching the situation with much interest, but are not showing much concern over the holding movement. Numbers of the mills in the New England textile districts have closed down, and the textile men are perfectly content for the time being to allow the farmers to carry the cotton.

Prices on nearby deliveries are held about steady, but the market for futures is weaker, owing to the uncertain outlook in the textile industry. Closing prices on the New York Cotton Exchange yesterday were:

	High	Low	Close
Nov.	——	——	20.25 nom.
Dec.	21.10	20.65	20.65 @ 20.66
Jan.	20.65	20.18	20.18 @ 20.20
Feb.	——	——	20.10 nom.
March	20.42	20.02	20.02 @ 20.05
April	——	——	19.92 nom.
May	20.20	19.72	19.72 @ 19.73
June	——	——	19.52 nom.
July	19.72	19.33	19.35 nom.
Aug.	——	——	19.20 nom.
Sept.	19.40	19.00	19.95 nom.
Oct.	18.75	18.75	18.50 bid

EGYPTIAN COTTON

Growers are reported to be refusing to sell at present bid prices, and activity in the Egyptian staple is being greatly curtailed. Conditions affecting the new crop continue unchanged, but it is yet too early for any safe predictions as to the probable size of the crop to be made. New England buyers are not showing much interest in offerings of Egyptian cotton, and the price of 70¼ to 83¼ cents per pound, depending upon grade, about rules the market.

SEA ISLAND COTTON

This branch of the market is attracting but little attention. The new crop will be too small to figure prominently in the cotton industry, and a majority of the former spinners of Sea Island are now using other varieties of long staple cotton.

AMERICAN-EGYPTIAN COTTON

Growers in the Southwest are proceeding in their plans to hold off the market as much long-staple cotton as possible. Stocks are being put into warehouses to await a more favorable turn in market conditions, and the growers apparently have secured sufficient financial assistance to take care of their needs for the time being. This action is not yet troubling the spinners, who are following the plan of waiting until they come to the bridge before crossing it. Under present market conditions, there is comparatively little demand for long staple cotton grown in the arid region of the Southwest.

TIRE FABRICS

Leading producers continue to keep their prices withdrawn, and are booking business at "the market" whatever the price may be on date of sale. Sellers are not quoting any prices openly, each price being determined by the individuals concerned in the transaction. Resumption of open market quotations is not looked for until the market for the raw cotton gets on a stable basis.

DRILLS, SHEETINGS AND OSNABURGS

Prices are lower all along the line, and demand is quiet for all varieties and sizes. Production has fallen off considerably, and a good part of the present light business is being done by second hands. On a firm bid, it would in all probability be possible to shade some of the prices quoted below, were large quantities desired. The mills are solving the labor situation, employes offering to work at reduction of 15 to 20 per cent in wages, providing the millmen will keep their plants in operation, or work them as much as possible.

HOSE AND BELTING FABRICS

Prices continue to tumble. Single filling ducks are down to 22 cents per yard, eard basis; double filling 24 cents per yard; enameling ducks 50 to 55 cents per pound; shoe ducks 60 cents per pound; hose and belting ducks 50 cents per pound. Despite these price declines, however, buyers are still holding off the market, as is usual in a declining market.

TIRE FABRICS

17¼-ounce Sea Island, combed, sq. yd.	Nominal		
17¼-ounce Egyptian, combed	—	@	—
17¼-ounce Egyptian, carded	—	@	—
17¼-ounce Peelers, carded	—	@	—
17¼-ounce Peelers, combed	—	@	—

DUCKS

Belting (pound basis) ..... lb.	.50	@	—
Hose (pound basis)	.50	@	—
*Enameling	.50	@	.55
Shoe Ducks	.60	@	—
Single filling ..... yd.	.22	@	—
Double filling	24.	@	—

*Price varies according to width.

DRILLS

37-inch 3.25-yard ..... yd.	13½	@	—
37-inch 2.75-yard	.15	@	—
37-inch 3.00-yard	.14½	@	—
37-inch 3.50-yard	.12½	@	—
37-inch 3.95-yard	.09½	@	.10

SHEETINGS

40-inch 2.35-yard ..... yd.	Nominal		
40-inch 2.50-yard	.17½	@	—
40-inch 2.85-yard	.13½	@	.14
40-inch 3.15-yard	.17¾	@	—
40-inch 3.60-yard	.13	@	.13½
40-inch 3.75-yard	.12	@	—
40-inch 4.25-yard	.10½	@	—

Note—In view of the unsettled conditions prevailing in the market at the present time, the prices quoted above are more or less nominal, and are not guaranteed.

BURLAPS
(Carload Lots)

	Cents	Per	Yard
7 -ounce 40-inch	——	@	——
7½-ounce 40-inch	6.25	@	——
7½-ounce 45-inch	6.50	@	——
8 -ounce 40-inch	6.75	@	——
8½-ounce 40-inch	——	@	——
10 -ounce 36-inch	——	@	——
10 -ounce 40-inch	Nominal		
10 -ounce 45-inch	Nominal		
10½-ounce 40-inch	8.25	@	8.35

* And higher, according to width.

Chemicals and Compounding Materials

NEW YORK, NOVEMBER 5, 1920

With few exceptions, the price trend during the past fortnight has been downward. Market conditions favor the buyer in many instances, but in a few lines, where demand is holding up, or where producers are booked far ahead, there has been no easing off in quotations. Buying of the general line for the account of the rubber industry has been running behind normal for some time past, and buying for the automobile industry has also shown a sharp falling off during the past few months. Many of the chemicals and compounding materials used by these industries, however, are also used by the paint industry, and business in this line is just beginning to slacken.

Production is falling off in many lines, however, and dealers in compounding materials and chemicals find it somewhat difficult to maintain prices under present market conditions. Producers of pigments are still keeping their division of the market firm, and demand appears to be keeping pace with production for these materials.

IMPORTS AND EXPORTS

Export buying is not proving to be an important factor in the present market, and the trade is not paying much attention to this phase. Numerous cancellations of contracts calling for shipment of American chemicals and compounding materials abroad have hindered business in the export field to a considerable extent. Supplies of foreign materials are coming in steadily, however, and shortages in some lines of goods are being made up by foreign shipments here.

LITHARGE

Slackening of demand from the rubber industry has had little or no effect upon the litharge market, and producers are still assured of a demand sufficiently strong to take care of all of their current production. Demand for litharge is keeping ahead of production and producers are still sold up ahead, being unable to take on any additional business at this time. Prices are firmly held.

LITHOPONE

New buying of lithopone continues light, but producers have on hand orders sufficient to take care of their production for the remainder of the year. Manufacturers are taking advantage of the present quiet market to enlarge their producing facilities. The spring demand of 1921 is expected to be the heaviest on record, and makers are hoping for a chance to lay by some surplus stocks, so as to preclude any possibility of being caught short as they were this year. The output for 1920 is expected to reach a total of 125,000 tons.

WHITING

Many manufacturers are oversold on whiting, and are not in the market for new business. Importations are showing some improvement, and the arrival of foreign supplies is helping to overcome the shortage in the domestic market.

BARYTES

New business for barytes has shown a falling off during the past two weeks, and the incipient boom that got under way toward the latter half of October has petered out. Producers are taking advantage of the present lull in buying, and are cleaning up many of their back orders, hoping to catch up with their business by 1921

ZINC OXIDE

Producers thus far have been successful in keeping prices on a firm basis, but the volume of business has fallen off steadily with the withdrawal of the tire industry from the field. Stocks are steadily finding their way upon the resale market, but the volume thus offered has not yet become sufficiently large to cause any alarm to the producers. Advices from primary markets indicate that business has fallen off considerably, but producers are doing a fair volume for prompt shipment.

DRY COLORS

Prices are being maintained on blacks in most quarters of the market, but a soft undertone is in evidence, and demand has fallen off considerably. A steady call for browns is reported, and the market is showing a firm undertone; imports steadily increasing. Trading in blues is routine in nature. Stocks of German blues have not met with much of a sale in domestic markets, and imports are falling off somewhat. Yellows are displaying a firm undercurrent, with a good routine business being done. Reds are showing an easier undertone.

CRUDES

Business in the market for benzol is picking up somewhat, and dealers are of the opinion that the market price has touched bottom. Prices are held steady at 34 to 38 cents per pound for the 90 per cent, and 36 to 40 cents per pound for the pure. A routine export inquiry is noted. Pure xylol is quoted a little off at 42 to 45 cents per gallon, but the commercial is stronger at 35 to 38 cents. Toluol is dull and nominally unchanged. Solvent naptha holds at 33 to 35 cents per gallon under a quiet demand. Phenol holds at 12 to 15 cents per pound for U.S.P.

INTERMEDIATES

Weakness is reported in the aniline oil market, and prices are nominally held under a dull demand. Producers are said to be offering stocks at prices sharply under those quoted in the open market. Anthroquinone is dull, and quotations are

very irregular, varying from $2.50 to $3.50 per pound. Price cutting is reported in all quarters of the market, and few inquirers withdraw from the market for lack of attractive offerings. Benzidine base is in liberal supply, and is offering at $1.20 to $1.30 per pound. Sulphate is dull and nominally held at $1.00. Benzaldehyde holds steady at 60 to 75 cents for technical, and $1.00 to $1.25 per pound for U.S.P. Nitrobenzol is quiet at 32 to 35 cents per pound. Betanapthol is showing an irregular tone, and is offering variously from 48 to 49 cents per pound for technical, and 85 cents firm for sublimed. Paranitraniline is firm. The paraphenylenediamine market is holding steady under a good routine demand.

Current Prices for Chemicals, Fillers, Colors, etc.

Acetone, carlots	lb.	.15¾ @	.16
smaller lots	lb.	.16½ @	.17
Acetanilid, C. P., bbls.	lb.	.45 @	.50
Acids, Acetic, 56 per ct.	cwt.	8.40 @	9.15
Carbolic, C. P.	lb.	.12 @	.20
Muriatic, 20 deg.	cwt.	2.25 @	2.75
Muriatic, 22 deg.	cwt.	3.00 @	3.25
Nitric, 42 deg.	cwt.	8.00 @	8.25
Nitric, 40 deg. cwt:		7.25 @	7.75
Sulphuric, 60 deg. car lots	tons	17.00 @	—
Sulphuric, 60 deg. car boys		22.00 @	—
Tartaric, crystals	lb.	.68 @	—
Aluminum Silicate		Nominal	
Aniline oil, bulk basis Contract		— @	—
Imported		Nominal	
Domestic		.27 @	.30
Antimony— Oxide	lb.	.10 @	—
Sulphuret, red	lb.	.22 @	.25
Sulphuret, golden	lb.	.28 @	.30
Sulphuret, crimson	lb.	.45 @	.50
Alcohol, denatured, 190 proof		— @	—
Wood, 95 per cent		1.90 @	—
Ethyl, 190 proof		Nominal	
Aldehyde Ammonia		Nominal	
Ammonia, powdered		.17 @	.17½
Ammonium Carbonate, domestic	lb.	.16 @	.16½
Amyl Acetate	gal.	3.85 @	4.00
Anthracene, 80 per cent		1.00 @	1.10
Anthroquinine, 95 per ct.		2.50 @	3.50
Asbestine		Nominal	
Asphaltum, Egyptian	lb.	.20 @	.25
Domestic	ton	.30 @	.40
Barium, dust		— @	—
Sulphide	lb.	— @	—
Barytes, prime white imported	ton	Nominal	
white, domestic	ton	35.00 @	40.00
off-color, domestic	lb.	20.00 @	30.00
Southern, f. o. b. mills		23.50 @	25.00
Western, f. o. b. mills		23.50 @	26.00
Beeswax		.21 @	.55
Benzidine Base	lb.	1.20 @	1.30
Benzol, 90 per ct.		.34 @	.36
Benzol, pure bulk, 100		.36 @	.40
Blanc Fixe, dry, bbls.	lb.	.06 @	.06½
Burgundy Pitch, dom.	lb.	.08 @	.10
Foreign		.60 @	.65
Blacks, Drop	lb.	.05½ @	.15
Ivory	lb.	.16 @	.30
Carbon, gas, cases	lb.	.12 @	.30
Lampblack, R M.	lb.	.12 @	.40
Mineral blacks	ton	35.00 @	45.00
Blues, Prussian		.90 @	.95
Soluble	lb.	.90 @	1.00
Ultramarine	lb.	.15 @	.50
Browns, Umber, Turkey, burnt powdered	lb.	.05½ @	.07
American, burnt	lb.	.04½ @	.06
Cadmium, sulphide, yellow	lb.	1.50 @	2.00
Carbon, Disulphide, bulk	lb.	— @	—
Bisulphide	lb.	.08½ @	.09
Casein, C. P.	lb.	.35 @	.36
Castor Oil		.14½ @	.16
Caustic Soda, 76 per ct.	cwt.	4.25 @	4.50
Chalk, precipated, extra light	lb.	.05½ @	.06
heavy	lb.	.04½ @	.05
China clay, domestic	ton	10.00 @	20.00
imported	ton	19.00 @	25.00
China Wood Oil, bbl.	lb.	.16 @	.16½
F.o.b. Pacific Coast		.14 @	—
Chloroform, U. S. P.		.43 @	.45
Coal Tar Pitch		— @	—
Cottonseed Oil, crude f.o.b. mills	lb.	10.50 @	—
Prime summer yellow	bbls.	12.00 @	—
Dimethylaniline	lb.	.85 @	—
Elateron		— @	—
Formaldehyde, spot	lb.	.27 @	.40
Fullers Earth, powd., carload lots		17.00 @	—
Fossil flour	lb.	.03¾ @	.05
Genasco Mineral Rubber		— @	—
Gilsonite	ton	55.00 @	65.00
Glue, extra white	lb.	.35 @	.45
medium	lb.	.29 @	.34
low grade		.21 @	.25
foot stock		.19 @	.22
brown foots		.19 @	.22
common bone		.18 @	.21
Glycerine, C. P. (drums)	lb.	.26 @	.27
cans		.28 @	.29
Graphite, flake (bbl.)	lb.	.14 @	.20
powdered (bbl.)	lb.	.05 @	.10
Green, chrome, R. M.	lb.	.42 @	.70
Ground glass (fine)	lb.	.03½ @	.04
Hexamethylene	lb.	1.50 @	1.60
Infusorial earth, powd'd.	lb.	.02 @	.035
bolted	lb.	.035 @	—
Iron oxide, red, reduced grades	lb.	.13 @	.15
red, pure, bright.	lb.	— @	—
Hexamethyenetetramine	lb.	1.75 @	2.00
Kaolin		— @	—
Lime, hydrated		— @	—
Lead, red, dry (casks)	lb.	.12¼ @	.12½
sublimed	lb.	— @	—
white, basic carb.	lb.	.10½ @	.11
white, basic sulp.	lb.	.10 @	.10¼
Lime flour	lb.	— @	—
Litharge (casks)	lb.	.11¾ @	.12¼
English	lb.	— @	—
Lithopone, domestic, bbls.	lb.	.08 @	.08¼
in bags	lb.	.07¾ @	.08
M. R. X.		— @	—
Magnesia, carbonate	lb.	.18 @	.19
calcined light	lb.	.60 @	.65
Magnesite, calcined, pwd.	ton	50.00 @	65.00
Magnesia, Oxide, heavy		— @	—
Light		— @	—
Extra light		— @	—
Napthalene	lb.	.10 @	.12
Nirobenzol		.13 @	.15
Naphtha, motor gasoline, (steel bbls.)	gal.	.31 @	—
68 @ 70 degress (steel bbls.)	gal.	.38 @	—
70 @ 72 degrees (steel bbls.)	gal.	.39 @	—
73 @ 76 degrees (steel bbls.)	gal.	.41 @	—
machine (steel bbls.)	gal.	.50 @	—
Oil corn, crude factory	cwt.	11.76 @	—
corn, ref. (bbls.)	cwt.	15.76 @	—
linseed, (bbls.)		1.05 @	1.07
In carloads, spot		1.02 @	1.04
tank cars		.95 @	.97
Oil palm, Lagos	lb.	.09¾ @	—
Niger		.09½ @	—
pine, yellow	gal.	1.45 @	1.60
distilled	gal.	1.86 @	1.90
rapseed, refined	gal.	1.25 @	—
rapseed, blown	gal.	1.45 @	—
rosin, first rectified	gal.	.75 @	—
second run		.74 @	—
tar (commercial)	gal.	.45 @	.48
Oleum Acid, 20 per ct.	ton	28.00 @	30.00
Orange mineral, Amer.	lb.	.15½ @	.16½
imported	lb.	Nominal	
Ozokerite		Nominal	
Paraphenylenediamine	lb.	2.60 @	2.70
Petrolatum, bbls., amber	lb.	.08 @	—
pale yellow	lb.	.07½ @	.08½
Paranitrosodimethylanaline		— @	—
Parafin, refined, 118 @ 120 m. p.		.10¾ @	.11
127 @ 129 m. p.		.09¾ @	.10¼
137 @ 140 m. p.		.11 @	.11½
Phenol		.12 @	.15
Pumis		.05 @	.10
Pine tar kiln	bbl.	15.00 @	—
Pitch	bbl.	9.25 @	—
Plaster of paris	bbl.	4.25 @	5.00
Red Tuscan	lb.	.15 @	.25
red (American)	lb.	.12 @	.16
Indian (English)		.14 @	.18
Standard	lb.	— @	—
Rosin (common to good)— 280 lbs.		12.85 @	—
Rotten stone, powdered	lb.	.02½ @	.04½
Rubber, substitute, black	lb.	.13 @	.17
white	lb.	.15 @	.24
brown	lb.	.20 @	.25
Rosin Oil, first rectified		.75 @	—
Second rectified		.74 @	—
Third rectified		.88 @	—
Fourth rectified		.94 @	—
Soda ash, light 58 pct.	cwt.	2.65 @	2.85
Sodium Nitrite .96@98 pct.		.16 @	.17½
Solvent Naptha, crude, hvy.		.33 @	.35
Soya Bean Oil, bbls.	lb	.11 @	—
Sellers, tanks, f. o. b. Coast		.08½ @	—
Stearic Acid, single		.16½ @	—
Shellac, fine orange	lb.	Nominal	
Sulphur Chloride, drums		.06½ @	.16
Shellac T. N.	lb.	.88 @	.90
Bleached, ordinary	lb.	.85 @	.95
Bleached, bonedry	lb.	1.05 @	1.10
Silex (silicia)	ton	25.00 @	40.00
Soapstone, powdered	ton	15.00 @	20.00
Starch, corn, powd.	cwt.	3.48 @	4.06
pearl		3.33 @	3.91
Jap potato, duty pd,	lb.	.06¾ @	—
Sulphur, crude	ton	— @	—
100 pounds		— @	—
roll		3.45 @	—
commercial superfine		2.10 @	2.35
Talc, American	ton	18.00 @	20.00
French	ton	30.00 @	—
Thiocarbanilid		— @	—
Toluol, pure, in drums	gal.	.35 @	.40½
commercial		.30 @	.32
Tripolite earth	lb.	.01½ @	—
Turpentine, pure gum— spirit	gal.	1.17 @	—
wood	gal.	1.10 @	—
Venice, artificial	gal.	.15 @	.16
true		3.00 @	3.10
Vermilion, English	lb.	1.40 @	1.45
American		.25 @	.30
Vorite		Nominal	
Wax, beeswax, crude yel.	lb.	.24 @	.26
refined		.31½ @	.32
Bayberry		.37 @	.39
ceresin, white	lb.	.15 @	.16
yellow		.14 @	.15
Whiting, commercial	cwt.	1.40 @	—
Gilders Bolted		1.45 @	—
Paris white, Amer.	cwt.	1.75 @	—
English cliffstone.	cwt.	2.00 @	—
Xylol (gal.) pure		.42 @	.45
Commercial		.35 @	.38
Zinc Oxide, French process, red seal		.11½ @	.11¾
green seal		.12½ @	.12¾
white seal		.13½ @	.13¾
Leaded Grades— Commercial, lead free		.08½ @	.10
5 per ct. lead sulphate		.09 @	.09½
10 per ct. lead sulphate		.08¾ @	.09¼
20 per ct. lead sulphate		.08½ @	.09
35 per ct. lead sulphate		.08¼ @	.08¾
Zinc Sulphate		.03½ @	.04½

Crude Rubber

NEW YORK, NOVEMBER 5, 1920

Crude rubber continues in a depressed condition, and the spot market has shown fractional declines from day to day during the past few weeks, prices today being materially under those quoted on October 25. Despite the lower prices being quoted from day to day, the demand has shown little, if any, improvement during this period.

Stocks of crude held in the local market are rather heavy, being estimated at about 30,000 tons. Much of this rubber has already been sold to rubber goods manufacturers and is being held in warehouses here until the consumers are ready to let the stock come forward to the factories. While the goods are held here, the manufacturers are paying all the carrying charges.

Manufacturers of druggists' sundries have been in the market for stocks of crude during the past few weeks, but these buyers are operating on a hand to mouth basis, so as to be in a position to take advantage of the lower prices made from day to day.

Some lots of "distress" rubber make their appearance on the market from time to time, but little buying interest is shown in these cuts, unless prices are cut to the bone in the offering. At the present time a lot of about 1,000 tons is offering on the market at slightly under quoted prices, but buyers are not taking hold in large volume.

Tire manufacturers are not letting much rubber come forward on contract

deliveries, and apparently have on hand sufficient stocks of crude to take care of their current consuming requirements.

Importers and dealers are basing their hopes on a stronger market on the tire industry. Members of the trade are optimistic over the outlook, and predict a better market after next March. It is at this time, they say, that the demand for automobile tires usually gets under way and they are looking for an active market in 1921.

Members of the domestic trade has been much interested in a cabled report from London received in New York a short time ago. This cable quoted M. F. Regan of the Rubber Planters' Union as saying that he had arranged for the sale of $10,000,000 worth of crude rubber to Russia, the delivery of the rubber to run over a two-years period. In payment for the rubber, the producers are accepting Russian currency notes, but the entire sum is to be paid in gold in Amsterdam in 1922. If true, the sale is welcomed, inasmuch as it will help to take off the market burdensome supplies which have lent weakness to prices for some time past. Prominent members of the British trade estimate that the world's surplus of rubber by January 1, 1921, will amount to over 30,000 tons.

All varieties of crude were quoted lower at the close of the market yesterday, latest bid and asked prices on the spot market being as follows:

Ceylons			
Smoked sheets ribbed, spot	.19	@	—
Smoked sheets ribbed, Nov.-Dec.	.20	@	—
Smoked sheets ribbed, Jan.-June	.24	@	—
Smoked sheets plain, spot	.17	@	—
First latex pale crepe	.23	@	—
Amber crepe, No. 1	.18	@	—
Amber crepe, No. 2	.17	@	—
Amber crepe, No. 3	.16	@	—
Clean brown crepe	.16	@	—
Light clean brown crepe	.19	@	—
Roll brown crepe	.15	@	—
Grand Central crepe	.16	@	—
Africans			
Rio Nunez string	—	@	—
No. 1 Benbuella	.12	@	—
No. 2 Benguella	.08	@	.10
Paras			
Up-river fine	.22	@	—
Up-river medium	.19	@	—
Up-river coarse	.14	@	—
Caucho ball	.15½	@	—
Islands fine	—	@	—
Maderia fine	.25	@	—
Cameta	.14	@	—
Knapsack	Nominal		
Centrals			
Corinto prime	.14	@	—
Esmerelda prime	.14	@	—
Miscellaneous			
Guayule wet	—	@	—
*Balata block Panama	.28	@	—
Balata sheets	.70	@	—
Palembang	.08	@	.08½
Columbian Block Balata	.48	@	—

*Nominal

Scrap Rubber

NEW YORK, NOVEMBER 5, 1920

Now that the election is over, dealers are looking for some improvement in the market for crude rubber, but no lasting increase in business is anticipated before the turn of the year. The action of the scrap market is being governed almost entirely by the movements in the market for crude, and the steady downward trend in prices in the latter market is being reflected in additional weakness in scrap. Prices during the last fortnight have shown little change, with the exception of one or two slight downward moves. For the majority of the articles dealt in by scrap rubber dealers, prices have already gone so low that they could not be weaker unless the dealers were to give the goods away, and perhaps pay delivery charges.

Reclaimers have not been in the market for stocks in any quantities for weeks past, and apparently have enough materials on hand to take care of their business during the present lull in buying. The normal fall buying movement has been entirely absent this year, and no hopes for a belated movement of the sort are entertained by members of the trade, who feel that the market will not get out of its rut until well after the turn of the year.

Dealers are more optimistic when talk of probable business conditions in 1921 is brought up, and there is a general feeling that business depression will soon be shaken off. The readjustment of prices in all lines of business has naturally had a very bad effect in conditions affecting all industries, but there is cause to believe that business will wake up next year. Latest revised quotations on the scrap rubber market are appended below.

	Cents per Pound.		
Solid Tires	1.50	@	2.00
Auto Tire Peelings	2.50	@	2.75
Truck Tires	2.00	@	2.25
Black Rubber	1.50	@	2.00
Boots and Shoes	5.25	@	5.50
Arctics, trimmed	4.00	@	4.75
Arctics, untrimmed	4.00	@	4 12½
Tire—Automobile	1.25	@	1.50
Bicycles, pneumatic	1.00	@	1.50
Mixed Hose	.50	@	1.00
Air Brake	1.50	@	—
Inner Tubes, No. 1	8.00	@	8.50
Inner Tubes, No. 2	5.50	@	6.50
Red Tubes	4.00	@	5.00

Personnel Changes in Akron

(Special Akron Correspondence)

Among the changes in personnel recently announced at Akron rubber factories are the following:

Edgard H. Gorusch, formerly with the chemical department of the Firestone Tire & Rubber Co., Akron, has become chief chemist at the plant of the Mason Tire & Rubber Co in Kent, succeeding A. H. McGachan who will enter business in Columbus.

S. B. Robertson has been appointed director of engineering of the B. F. Goodrich Co., succeeding George Perks who resigned recently. Robertson was formerly superintendent of the Pennsylvania railroad lines in Cleveland.

A Correction

The following correction has been received from D. F. Twiss, of the Dunlop Rubber Company, Ltd., Birmingham, England:

In connection with the suggestive article on Future Rubber Research on page 514 of your journal for September 25, I wish to point out that although the adjectival description of the manager of the British Rubber Research Laboratory is correct, the writer has by mischance given my name instead of that of Mr. B. D. Porritt, who holds the responsible appointment in question.

Importers of Rubber Goods

Lists of the principal importers of and dealers in rubber tires, shoes, clothing, druggists' sundries, and rubber goods for industrial purposes in Canada, Europe, and Latin America have been compiled by the Commercial Intelligence Section from reports submitted by a number of consuls. Some of these lists show not only the nature and character of the business but are starred to indicate the relative importance and size of each firm in its community. These lists may be obtained from the Bureau of Foreign and Domestic Commerce and its district and cooperative offices by referring to the titles and file numbers:

	File No.
Importers of and Dealers in Rubber Goods for Industrial Purposes in Canada	BE–1001
Importers of and Dealers In Rubber Boots and Shoes in Canada	BE–1002
Importers of Rubber Tires in Canada	BE–1003
Drug Stores and Dealers in Druggists' Sundries in Canada	BE–1004
Importers of and Dealers in Rubber Goods in Newfoundland	BE–1005
Importers of Various Lines of Rubber Goods in London, England	BE–2001
Importers and Manufacturers of Rubber Goods in Glasgow, Scotland	BE–4001
Importers of Rubber Goods for industrial Purposes in Copenhagen, Denmark	EUR–2031
Importers of Rubber Shoes in Copenhagen, Denmark	EUR–2032
Importers of Rubber Goods in Tunis, Tunis	EUR–3002
Importers of and Dealers in Rubber Goods in Palermo, Italy	EUR–6001
Importers of Rubber Goods in Lisbon Portugal	EUR–10010
Importers of Rubber Goods in Tangier, Morocco	EUR–17000
Importers of Rubber Goods in Colombia	LA–14009
Importers of Motor Cars and Accessories in Venezuela	LA–22006
Importers of Drugs and Druggists' Supplies in Venezuela	LA–22007
Importers of Clothing (Men's and Women's) in Costa Rica	LA–23012
Importers of Clothing (Men's and Women's) in Honduras	LA–25009

Erie Making Large Sizes

The Erie Tire & Rubber Co. has received equipment for building the largest size tire, the 40x8, and has already turned out several. It was desired to put one on display in a down town window, but the demand for this huge tire is so great that not one could be spared. All who have viewed the latest products of the local company can readily understand the pride with which the company puts the tire on the market.

American Rubber Patents

ISSUED OCTOBER 12, 1920

1,355,206—To Herbert Addison Woofter, Swampscott, Mass., assignor to Thompson Electric Welding Co., Lynn, Mass. Manufacture of articles of rubber.

1,355,278—To William T. Sherman, Troy, N. Y., assignor to Henry T. Hughes Co., Inc., New York, N. Y. Apparatus for inserting bristles in rubber pads.

1,355,282—To William C. Smith, Chicago, Ill. Seamed-tube machine.

1,355,609—To Otto Larson, Chicago, Ill. Pneumatic-tire shoe.

1,355,641—To William G. Adams, East San Diego, Cal. Vehicle-wheel rim.

1,355,734—To Francis Cole, Leyland, England. Apparatus for the manufacture of solid band-tires.

1,355,748—To Donald Stewart Kennedy, New York, N. Y. Resilient tire.

1,355,771—To Louis F. Nienaber, Akron, Ohio, assignor to Lambert Tire & Rubber Co., Inc., Akron, Ohio. Means for fastening cushion tires to rims.

1,355,785—To Emil C. Schultz, Streator, Ill. Emergency-tire.

1,355,788—To Charles W. Strauser, New York, N. Y. Tire.